

---

**STOPPING  
WATER POLLUTION  
AT ITS SOURCE**

3330 E



---

ACUTE LETHALITY DATA FOR ONTARIO'S  
ELECTRICAL POWER GENERATION SECTOR EFFLUENTS  
COVERING THE PERIOD FROM  
DECEMBER 1990 TO MAY 1991

---





ISBN 0-7778-0696-7

**ACUTE LETHALITY DATA FOR ONTARIO'S  
ELECTRIC POWER GENERATION SECTOR EFFLUENTS  
COVERING THE PERIOD FROM  
DECEMBER 1990 TO MAY 1991**

January 1995



Cette publication technique  
n'est disponible qu'en anglais.

Copyright: Queen's Printer for Ontario, 1995  
This publication may be reproduced for non-commercial purposes  
with appropriate attribution.

PIBS 3330E



**ACUTE LETHALITY DATA FOR ONTARIO'S  
ELECTRIC POWER GENERATION SECTOR EFFLUENTS  
COVERING THE PERIOD FROM  
DECEMBER 1990 TO MAY 1991**

Report Prepared By:

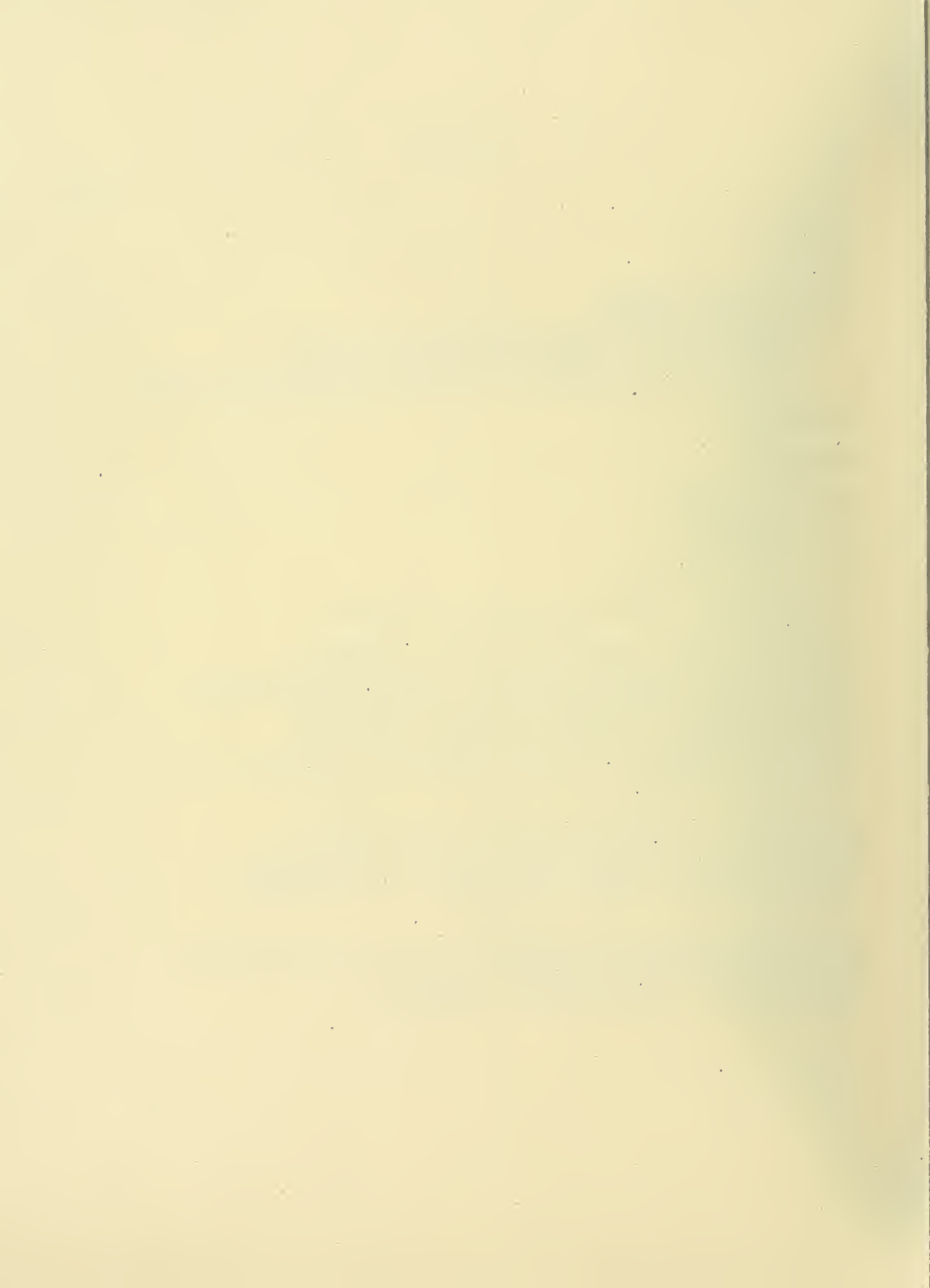
D.G. Poirier, J.T. Lee, M.C. Mueller  
and G.F. Westlake  
Aquatic Toxicology Section  
Standards Development Branch  
Ontario Ministry of Environment and Energy

January 1995



## CONTENTS

	Page
SUMMARY	1
GENERAL	2
TOXICITY TEST RESULTS	2
Hydraulic Generating Stations	2
Fossil-Fuelled Thermal Generating Stations	2
Nuclear-Powered Thermal Generating Stations	6
Facilities Associated with Nuclear Generating Stations	7
CONCLUSIONS	8
REFERENCES	10
FIGURE CAPTIONS	11
DATA SUMMARIES	
Decew Falls, Welland	
Sir Adam Beck 2 Generating Station, Queenston	
Atikokan Thermal Generating Station, Atikokan	
Lakeview Thermal Generating Station, Mississauga	
Lennox Thermal Generating Station, South Fredericksberg	
Lambton Thermal Generating Station, Courtright	
Nanticoke Thermal Generating Station, Nanticoke	
R.L Hearn Thermal Generating Station (mothballed), Toronto	
Thunder Bay Thermal Generating Station, Thunder Bay	
Bruce Nuclear Generating Station - A, Tiverton	
Bruce Nuclear Generating Station - B, Tiverton	
Darlington Nuclear Generating Station, Bowmanville	
Pickering Nuclear Generating Station - A, Pickering	
Pickering Nuclear Generating Station - B, Pickering	
Bruce Heavy Water Plant, Tiverton	
Bruce Nuclear Power Development - Services A&B, Tiverton	
Chalk River Laboratories, Chalk River	
Darlington NGS - Construction, Bowmanville	





## SUMMARY

Under the Municipal/Industrial Strategy for Abatement program the Electric Power Generation Sector facilities were required to monitor their liquid effluents (both process and cooling waters) for acute lethality to rainbow trout and *Daphnia magna* for a period of one year. This requirement was based on provisions in the Environmental Protection Act which allows the Ministry to write regulations requesting that persons responsible for sources of contamination monitor, record and report to the Ministry. Specific details of the testing and reporting requirements are identified in the General Effluent Monitoring Regulation (Ontario Regulation 695/88), and in the Effluent Monitoring Regulations for the Electric Power Generation Sector (Ont. Reg. 726/89). Much of the rational for specific monitoring requirements can be found in the Development Document for the Effluent Monitoring Regulation for the Electric Power Generation Sector (Env. Ont. 1990). This Monitoring data will be used, in part, to develop effluent limits for acute toxicity. This report is a compilation of the final six months of toxicity test results submitted by the companies, and from audit samples tested by the Aquatic Toxicity Unit in the Ministry laboratory in Rexdale. Most facilities involved in this regulation voluntarily submitted data for their intake water streams, and the information is included in this report.

Acute lethality tests are simple, rapid methods for measuring potential impacts on aquatic ecosystems. The regulations require the companies to conduct these test following standard procedures (Protocol to Determine the Acute Lethality of Liquid Effluents to Fish (Craig et. al. 1983) and the *Daphnia magna* Acute Lethality Toxicity Test Protocol (Poirier et. al. 1988)). In these tests, aquatic organisms are exposed to undiluted effluent, as well as a series of effluent dilutions, for a fixed period of time. The Ministry protocols require a 96 hour exposure period for trout and 48 hours for *Daphnia*. An LC50, the concentration of effluent estimated to cause 50% of the test animals to die, was calculated, where possible, for each sample. This statistic and its associated confidence limits are used as the measure of toxicity of the effluent.

Acute lethality toxicity tests will detect harmful concentrations of chemicals and mixtures of compounds in effluents, but compliance with end of pipe limits for acute toxicity will not necessarily control all adverse environmental effects. Sublethal and chronic effects on growth, reproduction and behaviour, and genotoxic effects may occur at concentrations orders of magnitude lower than acute effects. There is also the potential environmental effects caused by loading of bioaccumulative substances such as non-polar, high molecular weight organic compounds and metals such as mercury and cadmium.

The monitoring regulations required the companies to conduct acute lethality toxicity tests using rainbow trout and *Daphnia magna* on samples from selected discharge points and from process lines upstream from discharge. The collection of samples for toxicity testing coincided with the collection of samples for chemical characterization, also required under these regulations. Frequency of sampling was monthly for process effluent streams, and quarterly for once-through cooling water streams. There is a provision that allows a company to revert to single concentration trout testing on any process stream in which less than 2 fish die in any test in three consecutive sampling periods. The company reverts to full dilution series testing if more than two fish die in any single concentration test. There was no such provision for *Daphnia* testing.

Over the second six months of monitoring, the 17 facilities monitored in the Electric Power Generation Sector submitted toxicity results for 353 samples collected from 108 discharge points (Table 1). In addition there were results for 73 intake water samples, and 38 Ministry audit tests. Of the 353 samples submitted, 38 Ministry audit tests and 73 intake samples 79 samples were acutely lethal to trout and 121 samples were acutely lethal to *Daphnia magna*. The reporting from this sector went smoothly with data arriving in a timely fashion and few reports returned for correction. Presently there are 10 outstanding samples. Some of these samples were not tested due to high radiation counts at time of sampling, and others were not collected because the plant was not in operation during that month.

#### General

The Electric Power Generation Sector in Ontario consists of 86 generating stations and associated facilities. This sector was divided into four subgroups for ease of setting regulations:

- Hydraulic Generating Stations;
- Thermal Generating Stations;
- Nuclear Generating Stations; and
- Facilities Associated with Nuclear Generating Stations.

Chalk River Laboratories is a separate, unique facility operated by Atomic Energy of Canada Limited, but has been included with Facilities Associated with NGS for this review. A more thorough overview of Ontario's Electric Power Generation Sector can be found in the development document for the effluent monitoring regulation for the electric power generation sector (Env. Ont. 1990)

Many of the sampling points selected for monitoring are not final outfalls (ie. they do not discharge directly to surface waters, but undergo further treatment before discharge, or are mixed with other process/cooling water streams before discharge) and therefore do not

Table 1 Summary of Sampling for Toxicity Testing for the Electric Power Generation Sector, December 1990 - May 1991.

Subsection	No. Outfalls	No. Effluent Samples	No. Ministry Audits	No. Intake Samples	No. Lethal Samples
<b>Daphnia</b>					
Hydraulic G.S.	4	6	0	3	1
Fossil Fuelled T.G.S.	50	166	30	37	64
Nuclear G.S.	38	124	2	26	38
Facilities Associated with N.G.S.	15	76	6	8	20
<b>Trout</b>					
Hydraulic G.S.	4	6	0	3	0
Fossil Fuelled T.G.S.	49	159	29	40	27
Nuclear G.S.	38	112	2	22	33
Facilities Associated with N.G.S.	16	59	6	8	17

Table 2: Summary of Toxicity of Electric Power Generation  
Sector Effluents to Rainbow Trout and *Daphnia magna*  
December 1990 to May 1991

Sampling Site							
Thermal G.S.	W.T.P. Neutral. Sump	Boiler Blowdown	Oily Water Separator	Ash (Lagoon) Transport	Coal Pile Effluent		Intake
Atikokan	A0/9 <sup>B</sup> 1/8	2/8 8/8	0/9 0/9	0/9 2/9	N/A N/A	N/A N/A	0/7 0/4
Lakeview	1/1 1/1	3/8 8/8	0/14 4/14	0/7 0/7	1/9 0/9	N/A N/A	0/6 0/6
Lambton	0/1 0/1	2/8 7/8	N/S N/S	0/7 0/7	N/A N/A	N/A N/A	0/6 0/6
Lennox	0/5 0/6	1/5 6/6	0/5 0/6	N/A N/A	N/A N/A	N/A N/A	0/5 0/6
Nanticoke	N/S N/S	5/9 10/10	N/S N/S	(7/7)-0/7 (6/7)-0/7	N/A N/A	N/A N/A	0/6 0/6
Thunder Bay	3/8 4/8	3/7 7/7	0/8 0/8	0/8 0/8	N/A N/A	N/A N/A	0/6 0/6
Nuclear G.S.	W.T.P. Neutral. Sump	Boiler Blowdown	Oily Water Separator			Radio- active Liquid Waste	Intake
Bruce A	6/6 6/6	2/6 3/6	N/S N/S	N/A N/A	N/A N/A	1/7 2/7	0/6 0/6
Bruce B	1/6 1/6	0/6 0/6	N/S N/S	N/A N/A	N/A N/A	0/6 1/6	0/6 0/6
Darling.	5/6 5/6	3/3 1/3	3/6 4/6	N/A N/A	N/A N/A	0/6 0/6	1/6 1/6
Pickering	0/7 0/7	10/12 11/11	0/11 1/11	N/A N/A	N/A N/A	1/6 1/6	0/6 0/6

A - # Samples lethal  
B - # Samples tested  
T/T - Rainbow Trout  
D/D - *Daphnia magna*  
N/A - Not applicable  
N/S - Not sampled



necessarily represent the quality of the final effluent. The data summaries in this report include many sampling points which have no data. These points were not included in the monitoring regulation, but indicate the number of process and cooling water streams present in each facility.

### Toxicity Test Results

The following is a description of the outfalls which were toxic to rainbow trout and/or *Daphnia magna* during the second six months of the MISA sampling period. Sampling sites which were consistently lethal were plotted to assess any trends in toxicity. An attempt was made to compare chemistry data to toxicity data to find possible causes of lethality for these samples. In most cases there was sufficient chemistry data to make an evaluation, but in some cases there was insufficient data, or no obvious explanation for the observed biological effects.

The data summaries include only the basic information for all the toxicity data submitted during the second six months of the monitoring program. The complete data set resides in the Ministry's toxicity relational database system (Environment Ontario 1989) and is available upon request. Ministry audit data is included in the graphs and the discussions for each discharger. The comment fields for each sample were entered by the industry's laboratory performing the tests and should not be expected to be consistent across samples, and do not necessarily represent the views of the Ministry.

### Hydraulic Generating Stations

There were no trout or *Daphnia* mortalities in any toxicity test conducted on effluent samples from the two hydraulic generating stations monitored in the MISA regulations. There was one intake sample from the Sir Adam Beck 2 GS in Queenston which was lethal to *Daphnia*. There was no chemistry data submitted for this sample.

### Thermal Generating Stations

The lethal effluents from the Thermal Generating Stations were from two main sites: 1) the Boiler Blowdown effluents, and 2) Water Treatment Plant Neutral Sumps (Thunder Bay TGS, Atikokan TGS (*Daphnia*), and Lakeview TGS). Occasionally Ash Lagoon (Nanticoke TGS) and Oily Water Separator (Lakeview TGS) samples were toxic.

Boiler Blowdown effluent were consistently toxic to both trout and *Daphnia*. 45 of 46 boiler blowdown effluents tested for 6 thermal generating stations were acutely lethal to *Daphnia* and 16 of 45 were toxic to trout (Table 2). For trout it appeared that much of the toxicity of the effluents might be attributed to a combination of very low ionic strength, pH between 8 and 12, free ammonia ( $\text{NH}_3$ ) between 100 and 1000 ug/L and copper ( $\approx 30$  ug/L), and zinc ( $\approx 100$

ug/L). Boiler blowdown effluents have been purified to reduce fouling in the system and have very low conductivities ( $< 20$  uS/cm) and hardness. This lack of ions creates stress on aquatic organisms as they attempt to maintain an internal ionic balance against a steeper environmental gradient. In laboratory tests using distilled or deionized water, trout did not die in water with conductivities  $< 10$  uS/cm, though fish showed signs of stress with increased mucous secretion and dark pigmentation. During the MISA testing, all fish tended to die in the undiluted boiler blowdown effluent (100% concentration), but few if any died in the next lowest concentration (usually 65 or 80% effluent). The presence of low concentrations of contaminants, primarily ammonia, was enough to cause mortalities under these soft water, high pH conditions.

*Daphnia* were much more sensitive to boiler blowdown effluents than were trout. During previous laboratory testing *Daphnia* died in pure distilled or deionized water, but were unaffected once conductivity values exceeded approximately 40 uS/cm. MISA testing indicated that low ionic strength was a major contributor to toxicity of hydro effluents, but it was not the sole cause of toxicity. It appears that various combinations of low hardness, high pH, unionized ammonia, and metals (Cu, Zn) contributed to toxicity. Ammonia is added as a process chemical to control pH in some facilities, and hydrazine is used as an antioxidant in all facilities. Atikokan TGS (Figure 1) consistently had very low conductivity (10 - 20 uS/cm), and had concentrations of ammonia  $> 300$  ug/L. Lakeview TGS typically had conductivity  $< 10$  uS/cm, pH  $> 9$  and Cu up to 50 ug/L. Lambton TGS was typified by conductivity  $< 25$  uS/cm, pH  $> 8.8$ , and Cu concentrations up to 90 ug/L.

Water Treatment Plant Neutralization Sump samples from Thunder Bay TGS, Lakeview TGS and Atikokan TGS were acutely lethal to trout and *Daphnia*. Of the 17 samples collected from these three stations 4 were toxic to trout and 6 were toxic to *Daphnia* (Table 2). Most of these toxic samples were from Thunder Bay TGS (Figure 3). WTP Neutral Sump samples were characterized by extremes in pH (either  $< 3$  or  $> 12$ ), low levels of oil and grease, and occasionally toxic levels of ammonia or copper. The Ministry audit sample collected in February from the WTP Neutral Sump at Thunder Bay TGS did not correspond well with the company submitted data. The Ministry sample was non-lethal, and the company sample taken a few days previously had LC50s  $< 20\%$ . The toxicity of these samples was variable throughout the year, and this difference may be inherent in the process. There was insufficient chemistry for the Ministry sample to assess the differences in toxicity. The Ministry audit sample from Lakeview TGS was taken upstream of final treatment, and does not represent final effluent quality.

Samples from the Ash Lagoon at Nanticoke TGS (Figure 2) were lethal to trout and *Daphnia*. Seven of seven samples from this site were lethal to trout and six of seven samples were lethal to *Daphnia* (Table 2). Chemistry submitted for this site indicates that pH was

always > 9, and ammonia concentrations exceeded 3.7 mg/L. Effluent from this site is normally discharged to a forebay where it is mixed with lake water and then recycled as cooling water before final discharge. Samples from the Ash Transport System at this generating station were not acutely toxic to trout or *Daphnia*. Two of nine samples from the Ash Transport System at Atikokan TGS were toxic to *Daphnia*, but not trout. No individual effluent parameter stood out as being at toxic levels. pH was between 8 and 9, and free ammonia concentrations were approximately 120 ug/L.

Four of 14 samples from the Oily Water Separator/Powerhouse at Lakeview TGS were toxic to *Daphnia*, but not to trout (Table 2). These effluent samples were typified by oil and grease concentrations between 5 and 11 mg/L. Comments on some of the toxicity data sheets indicated that the *Daphnia* were trapped in a surface film of oil and in some cases died. This effluent is also chlorinated to prevent biofouling of the oil/water separator, and this may cause some of the toxicity in the samples. The practice of chlorinating this stream has since been stopped by Hydro. Other oil/water separators tested did not have toxic effluent.

One of nine samples of Coal Pile Effluent from Lakeview TGS was toxic to trout. This sample contained 23 mg/L  $\text{NH}_3/\text{NH}_4^+$  at a pH of 8.5. Free ammonia ( $\text{NH}_3$ ) concentrations under these conditions would be in the range of 1.8 mg/L, well over the 96 h LC50 values cited in the literature.

### *Nuclear Generating Stations*

Acutely lethal nuclear generating station effluents were collected from: 1) Boiler Blowdowns, 2) Waste Treatment Plant Neutral Sumps, 3) Radioactive Liquid Waste Management (\*\*\*RLWM) Tanks, and 4) Oily Water Separators, though the toxicity of these outfalls varied significantly between facilities (Table 2).

Waste Treatment Plant Neutralization Sump samples were consistently toxic to trout and *Daphnia* at Bruce NGS-A (Figure 4) and Darlington NGS (Figure 5). These samples continued to be the most toxic in this sector with LC50 values as low as 0.2% effluent. The samples from these sites characteristically were very acidic with pH usually < 3, high suspended solids levels, and moderate concentrations of Cu, Zn, or Al. Two of eight samples at Bruce NGS-B were acutely lethal only to *Daphnia*. pH of these samples were approximately 5, and Al concentrations exceeded 30 mg/L. WTP Neutral Sump samples from Pickering NGS were not acutely lethal.

Boiler Blowdown effluents from Bruce NGS A, Darlington NGS and Pickering NGS were toxic to trout (15/21 samples) and *Daphnia* (15/20 samples). Bruce NGS-B was relatively non-toxic with only one sample acutely lethal to *Daphnia*, and none lethal to trout. Very low ion concentrations (low conductivity) play a significant role in toxicity of these effluent samples, but other toxicants



were also involved. As with the fossil fuelled thermal generating stations, NGS boiler blowdown effluents characteristically have pH > 9, free ammonia concentrations > 100 ug/L, and in some cases moderate to high concentrations of Cu and/or Zn. It is most likely a combination of all these factors which cause lethality in the test animals.

Oily Water effluent samples from Darlington NGS (Figure 6) were toxic to trout (3/6 samples) and *Daphnia* (4/6 samples). These samples had high pH (> 8), high concentrations of Zn (190 - 550 ug/L), and occasional high concentrations of oil and grease. One of eleven samples from the Oily Water Separator at Pickering NGS was toxic to *Daphnia*. This sample had a concentration of oil and grease = 8.4 mg/L.

There were a few lethal samples from the Radioactive Liquid Waste Management Tanks at Bruce NGS A and B, and Pickering NGS. The lethal sample from Pickering NGS had oil and grease = 14.8 mg/L, but there was insufficient chemistry data to indicate the cause of toxicity in the other samples.

#### *Facilities Associated with Nuclear Power Generation*

These facilities were a diverse group, and included Bruce Nuclear Power Development Services A & B (BNPDS), Bruce Heavy Water Plant (BHPW), Chalk River Laboratories, and Darlington- Construction. Toxic samples were primarily from two outfall types: 1) Waste Treatment Plant Neutralization Sumps, and 2) Sanitary Sewer/ Sewage Treatment sites.

WTP Neutral Sump samples from BNPDS (1/1 samples) and Darlington-Construction (5/7 samples) were toxic, with LC50s ranging from 14.1% to 46.7% effluent for trout, and from 5.9% to 14.1% effluent for *Daphnia*. The characteristics of these effluents were similar to WTP Neutral Sump samples from TGS and NGS. Typically, pH was in the 1 to 4 range, Cu = 32 - 75 ug/L, and concentrations of Al and Sr were between 500 and 1500 ug/L. A combination of low pH and moderate metal concentrations could be contributing to effluent toxicity. At BNPDS (Figure 9), the WTP Neutral Sump discharges to the CE SP STP-O before leaving the site. The CE SP STP-O samples were non-lethal.

All six Sanitary Sewer effluent samples collected from Chalk River Laboratories were acutely lethal to trout and *Daphnia* (Figure 7). The effluent samples were slightly more toxic to *Daphnia* than to trout, and LC50 values ranging between 14.2 and 80.6% effluent. The Sanitary Sewer samples typically had pH = 4.5 - 5.7, very high concentrations of  $\text{NH}_3/\text{NH}_4^+$  (6.09 - 11.2 mg/L), Cu = 50 - 740 ug/L, Zn = 80 - 310 ug/L, Al = 3.0 - 41 mg/L, and oil and grease = 3.0 - 13.3 mg/L. All of these conditions individually can have some acute toxicity to trout and *Daphnia*. Under federal regulations Chalk River Laboratories (and other federal facilities) are



required to chlorinate their final sewage effluent, and this practice may increase the toxicity of the samples. Chlorine concentrations ranged between 0.2 and 3.0 mg/L (measured as total residual oxidants), and lethality in the samples increased as TRO concentrations increased.

Fifty percent (4/8) of the Sewage Treatment effluent samples collected from Darlington-Construction were acutely lethal to trout and *Daphnia* (Figure 8). Effluent toxicity was variable with LC50s ranging between 7.1% effluent and non-lethal for trout and 5.9% and non-lethal for *Daphnia*. The Sewage Treatment effluent at Darlington-Construction had a neutral pH (6.7 - 7.4), low concentrations of metals (Cu = 36 - 80 ug/L, Zn = 50 - 130 ug/L, Al < 150 ug/L), some oil and grease (one sample with 10.3 mg/L), and total ammonia concentrations < 3.5 mg/L. With the exception of oil and grease, none of these chemical parameters is likely to have a large role in toxicity of the effluent samples. Test observations indicated that trout exposed to undiluted effluent all died within two hours of exposure. This suggests there is a high concentration of some rapid acting toxicant in the samples. Chlorine is added to most sewage outfalls as a disinfectant, and high chlorine concentrations (200 to 650 ug/L) might explain the rapid toxicity of these effluent samples.

There were a few other samples in this group which were toxic. A Ministry audit sample from the SW-D Point Ditch (#800) at BNPDS was toxic to *Daphnia*, but not to trout. This sample had a conductivity = 18 uS/cm and pH = 9.1 which could have caused the observed mortalities. There were two lethal samples from the Power House Drain at Chalk River. Both samples had pH value in excess of 10.5, and this could be contributing to the toxicity of the sample. One sample of Boiler Blowdown Effluent from Darlington-Construction was toxic to trout and *Daphnia*. This sample was not typical of boiler blowdowns in other groups because the conductivity was high (1070 uS/cm). However, the toxic sample had high pH (10.7) and Cu = 294 ug/L, both of which could contribute to toxicity. One sample of intake water at Darlington-Construction was toxic to *Daphnia*. There was insufficient chemistry data to assess the causes of toxicity in this sample.

## Conclusions

The trends in the second six months of MISA monitoring of the Electric Power Generation Sector were similar to those in the first six months. In general *Daphnia magna* was more sensitive to Electric Power Generation Effluents, particularly Boiler Blowdown effluents than were trout, although on a few occasions the reverse was true. Boiler Blowdown effluents generated more toxic samples than the other sampling sites, but they were seldom the most toxic. Typically the most toxic samples (ie. lowest LC50s) were from the WTP Neutral Sumps. This relationship held true for fossil fueled and nuclear GS, as well as facilities associated with NGS.

Toxicity is probably caused by combinations of chemical/physical parameters. For Boiler Blowdown samples, toxicity was primarily compounded by very low ion concentrations, but was also related to pH values, free unionized ammonia ( $\text{NH}_3$ ) and moderate concentrations of Cu, Al and/or Zn. Cyanide did not appear in high concentrations as it did on occasion in first six months of sampling these outfalls. For WTP Neutral Sump samples toxicity may have been related to a combination of various factors: pH < 4 or pH > 12, high concentrations of some metals, and unionized ammonia. Toxicity of \*\*\* RLWM Tank samples appear related to high concentrations of oil and grease and on one occasion very low conductivity. Toxic Ash Lagoon samples had high pHs (8 - 12) combined with total ammonia/ammonium concentrations between 1 and 23 mg/L. Unionized ammonia concentrations between 100 and 2100 ug/L would be expected under these conditions (MOE 1984). The Ash Lagoon sytem at Nanticoke TGS has since been converted to a dry fly ash system.

## References

- Craig, G., K. Flood, J. Lee, and M. Thompson. 1983. Protocol to determine the acute lethality of liquid effluents to fish. Queen's Printer for Ontario. 9 pp.
- Environment Ontario. 1990. The development document for the effluent monitoring regulation for the electric power generation sector. Queen's Printer for Ontario. 62 pp.
- Ontario Ministry of the Environment. 1984. Water Management - Goals, policies, objectives and implementation procedures of the Ministry of the Environment. 70 pp. Queen's Printer, Toronto.
- Poirier, D.G., G.F. Westlake, and S.G. Abernathy. 1988. Daphnia magna acute lethality toxicity test protocol. Queen's Printer for Ontario. 11 pp.

## FIGURE CAPTIONS

These figures represent only the effluent sampling points which had consistently acutely lethal samples.

- Figure 1: The acute toxicity of Boiler Blowdown (300) effluent samples collected from Atikokan TGS to trout and *Daphnia*.
- Figure 2: The acute toxicity of Ash Lagoon (100) effluent samples collected from Nanticoke TGS to trout and *Daphnia*.
- Figure 3: The acute toxicity of Waste Treatment Plant Neutralization Sump (1500) effluent samples collected from Thunder Bay TGS to trout and *Daphnia*.
- Figure 4: The acute toxicity of Waste Treatment Plant Neutralization Sump (2000) effluent samples collected from Bruce NGS-A to trout and *Daphnia*.
- Figure 5: The acute toxicity of Waste Treatment Plant Neutralization Sump (2200) effluent samples collected from Darlington NGS to trout and *Daphnia*.
- Figure 6: The acute toxicity of Oily Water Separator (1900) effluent samples collected from Darlington NGS to trout and *Daphnia*.
- Figure 7: The acute toxicity of Sanitary Sewer (500) effluent samples collected from Chalk River Nuclear Laboratories to trout and *Daphnia*.
- Figure 8: The acute toxicity of Sewage Treatment (800) effluent samples collected from Darlington Construction to trout and *Daphnia*.
- Figure 9: The acute toxicity of Waste Treatment Plant Neutralization Sump (1100) effluent samples collected from Darlington Construction to trout and *Daphnia*.

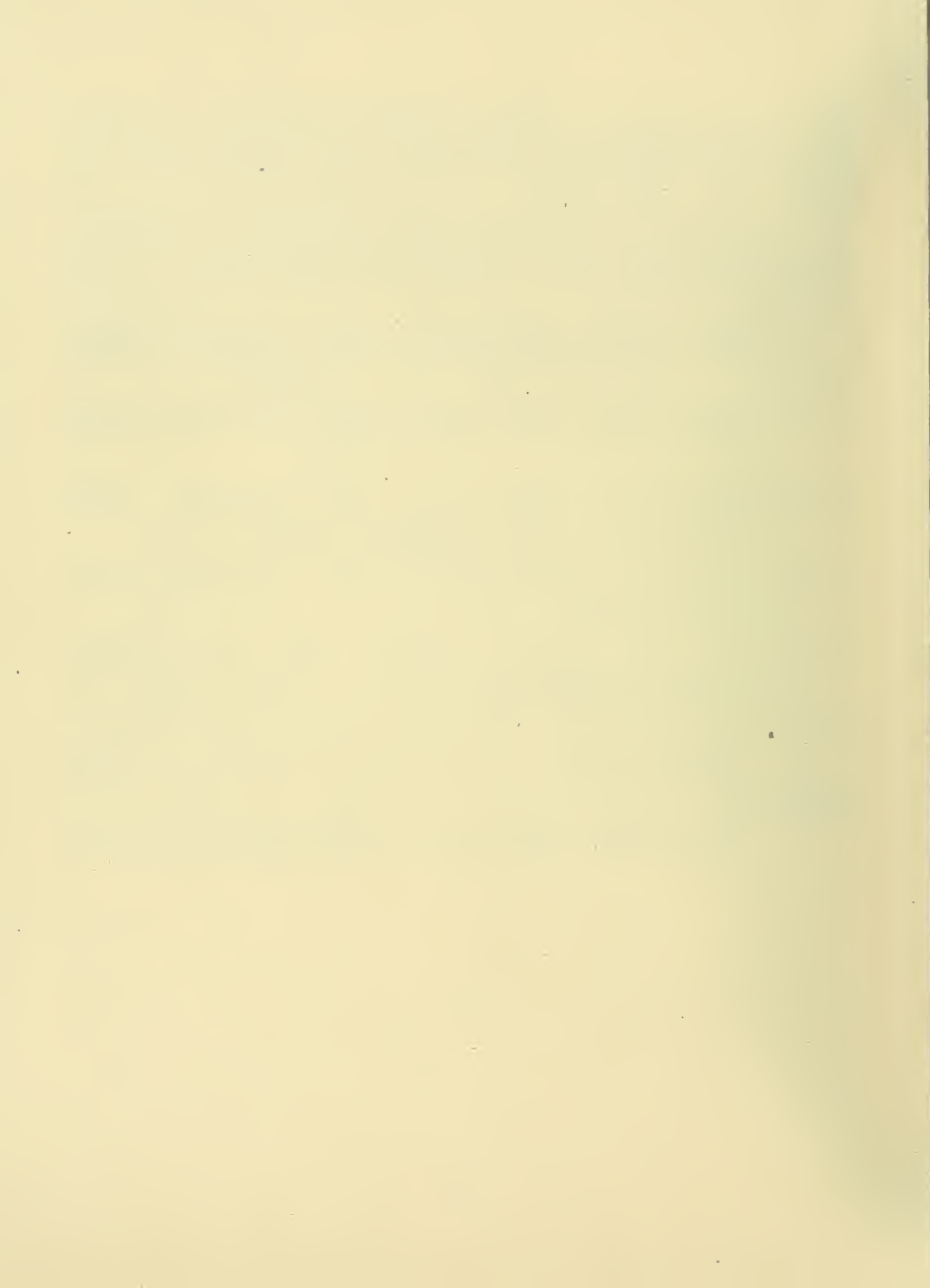


Figure 1.  
Atikokan TGS  
Boiler Blowdown (300)

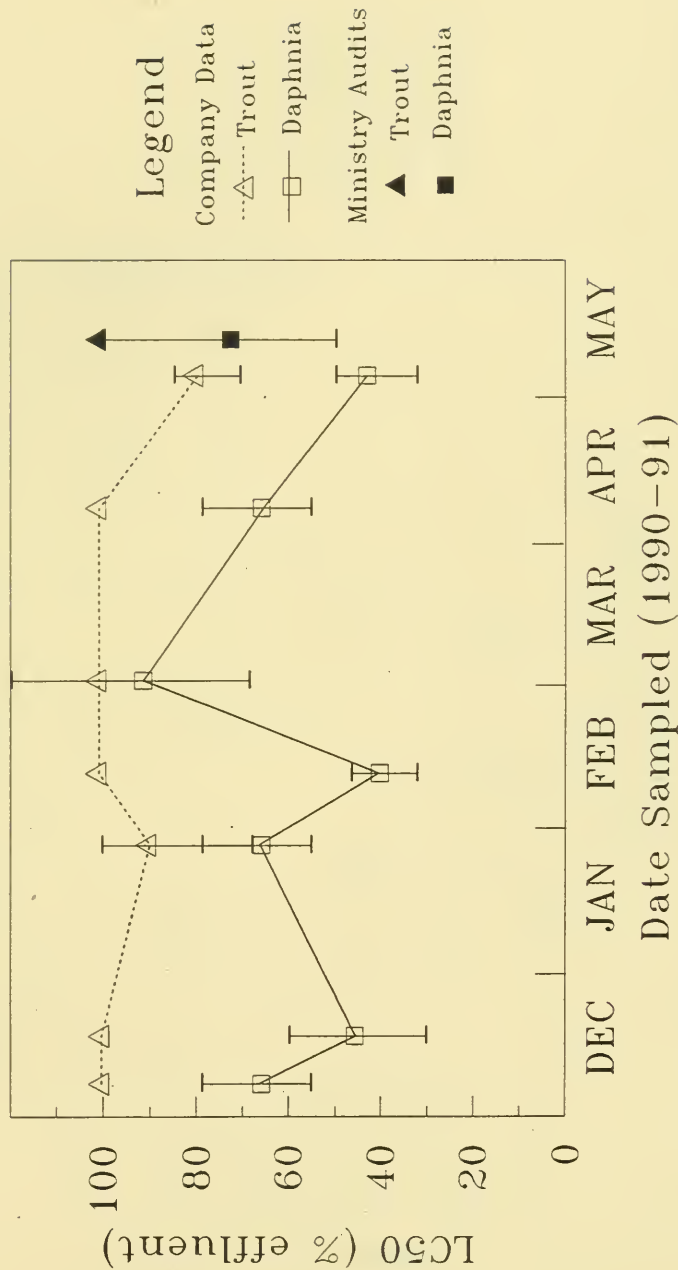


Figure 2.  
Nanticoke TGS  
Ash Lagoon (100)

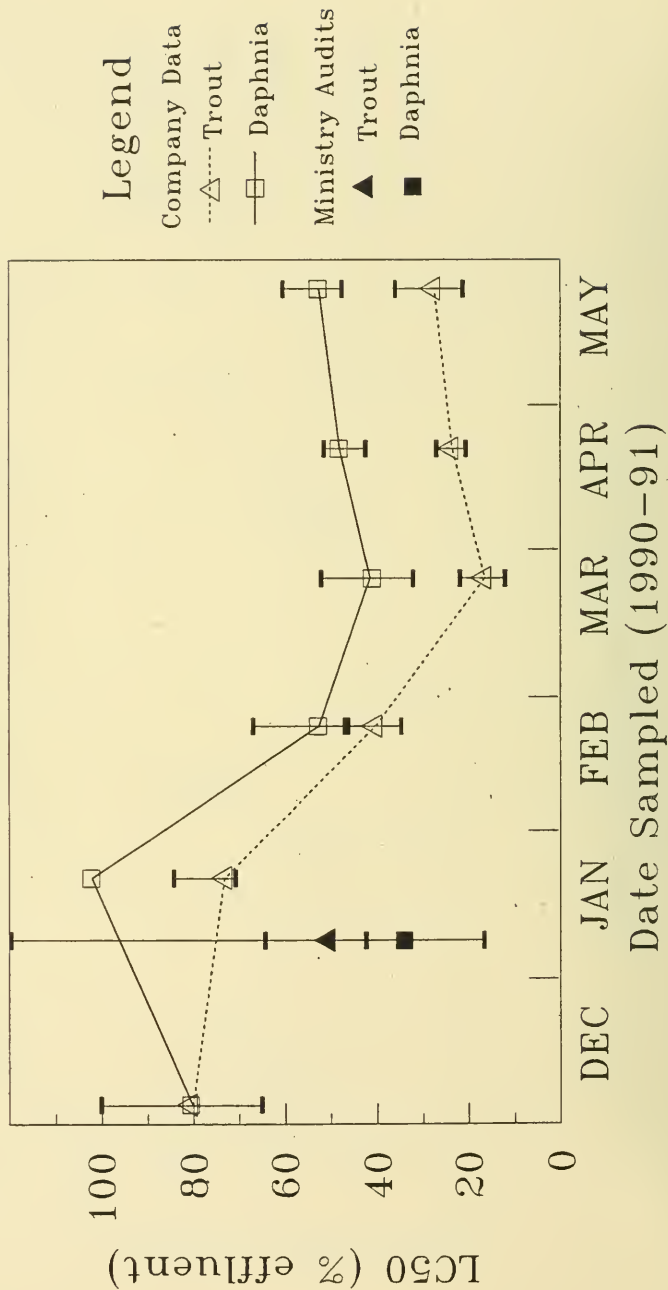


Figure 3.  
Thunder Bay GS  
WTP Neutral Sump (1500)

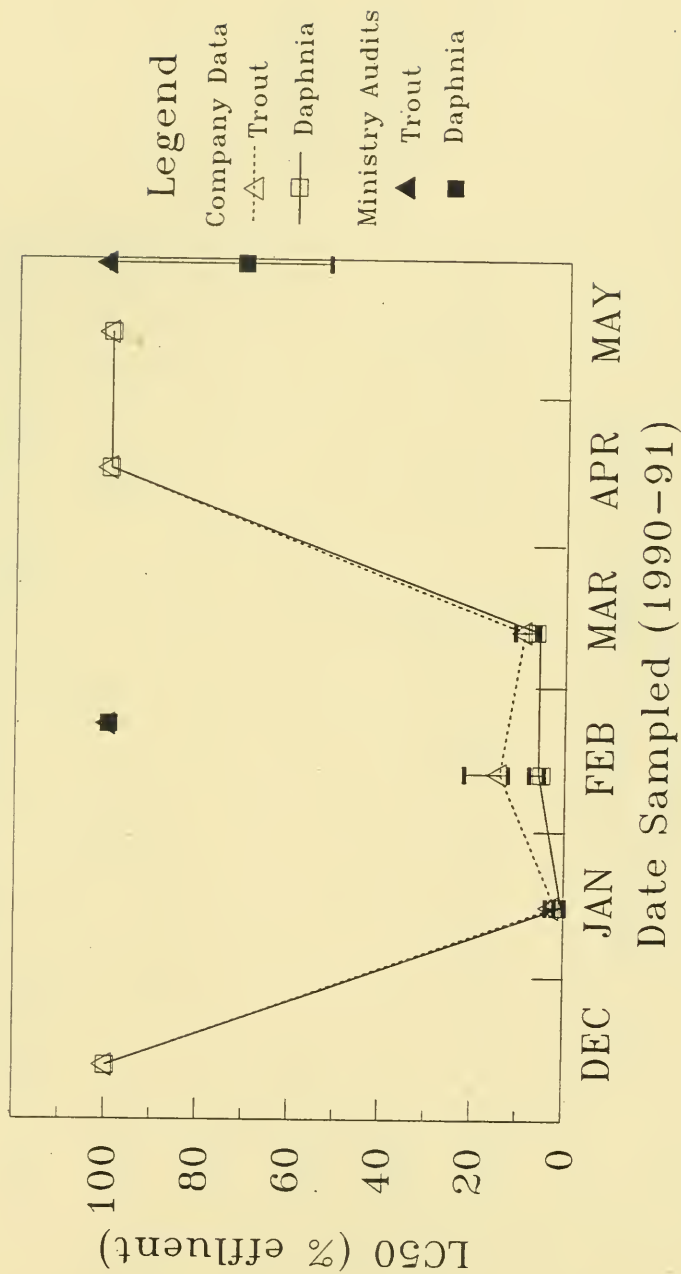


Figure 4.  
Bruce NGS A  
WTP Neutral Sump (2000)

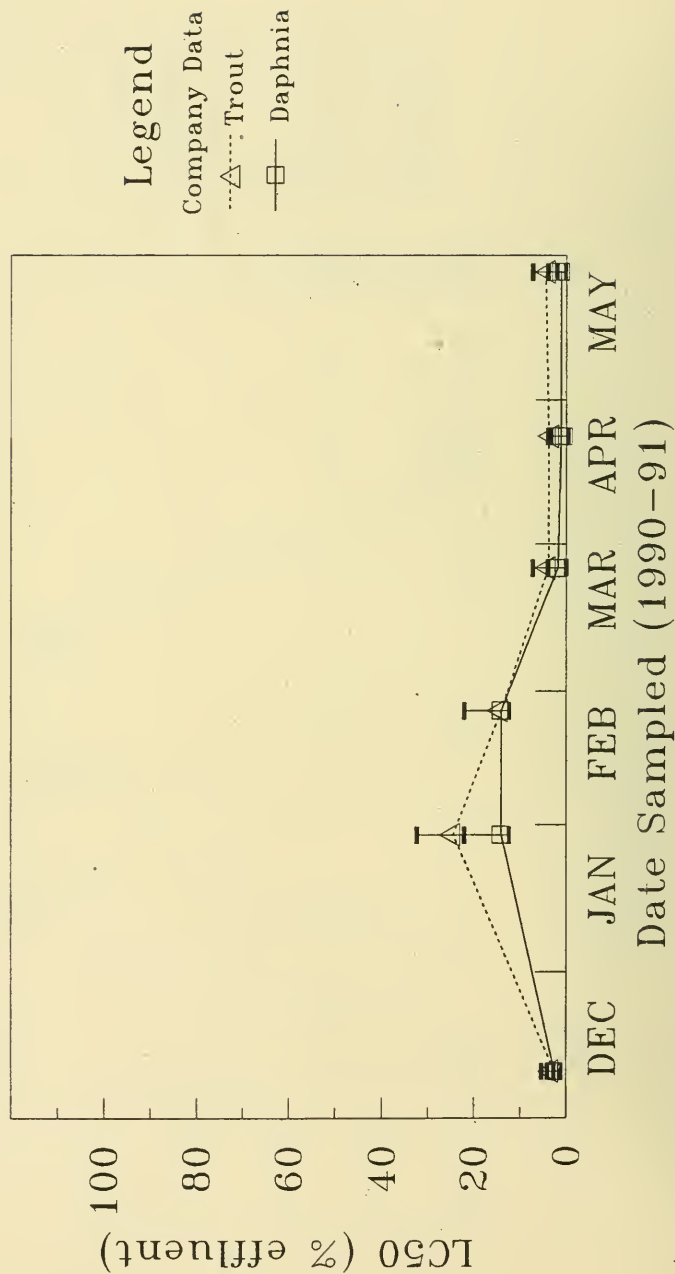




Figure 5.  
 Darlington NGS  
 WTP Neutral Sump (2200)

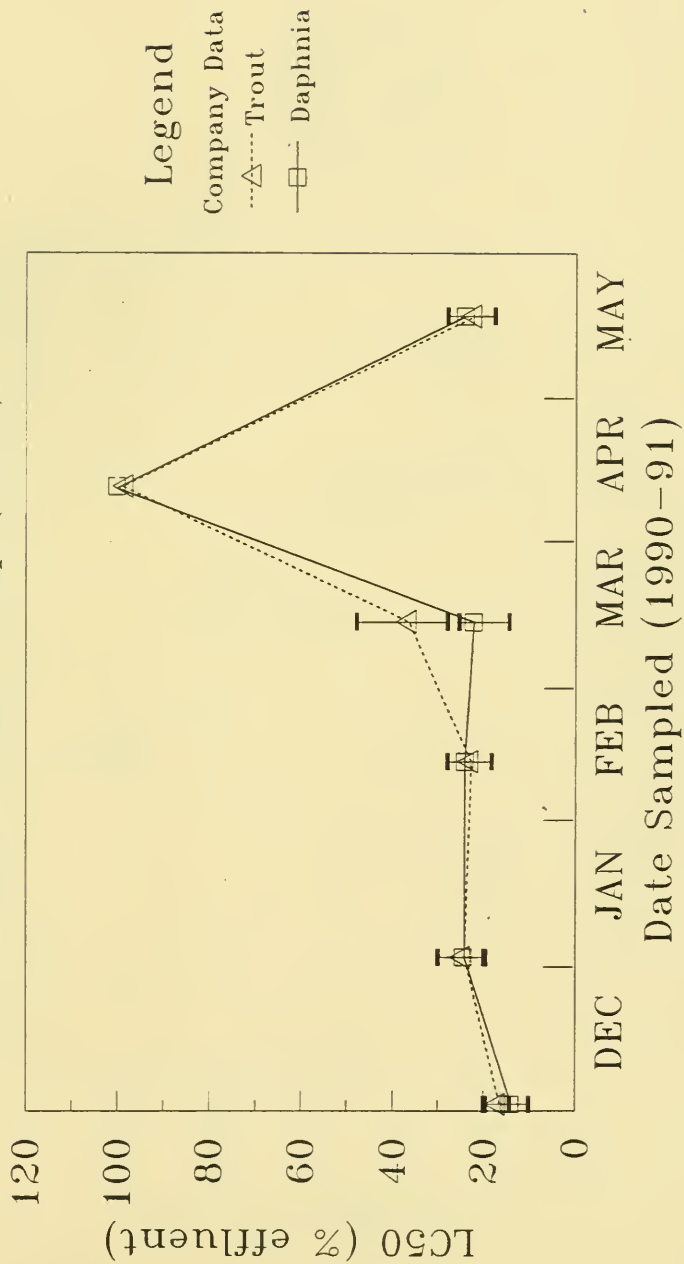


Figure 6.  
Darlington NGS  
Oily Water Separator (1900)

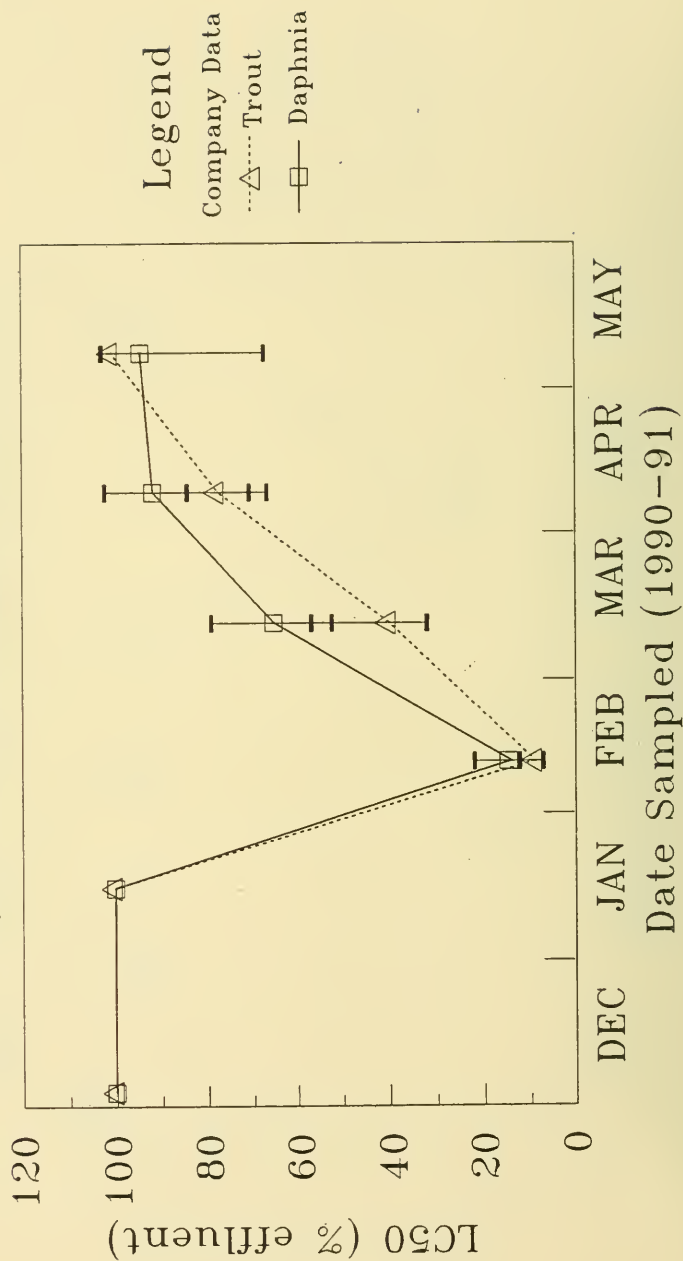


Figure 7.  
Chalk River Laboratories  
Sanitary Sewer (500)

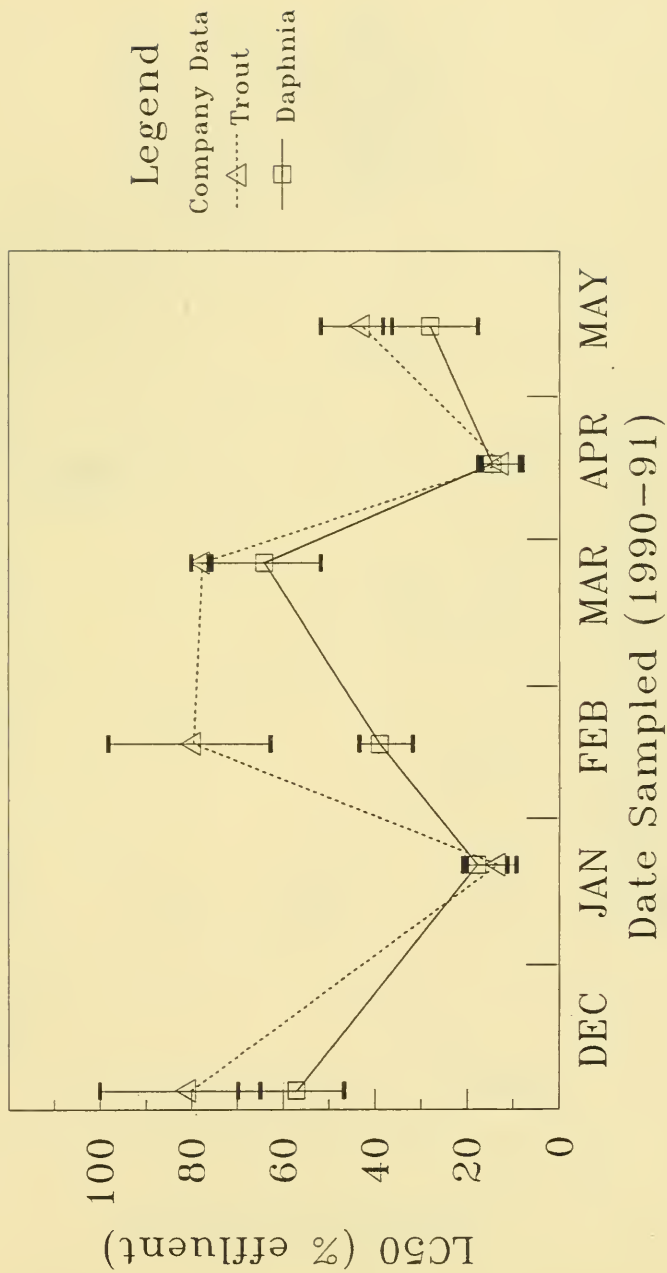


Figure 8.  
Darlington Construction  
Sewage Treatment (800)

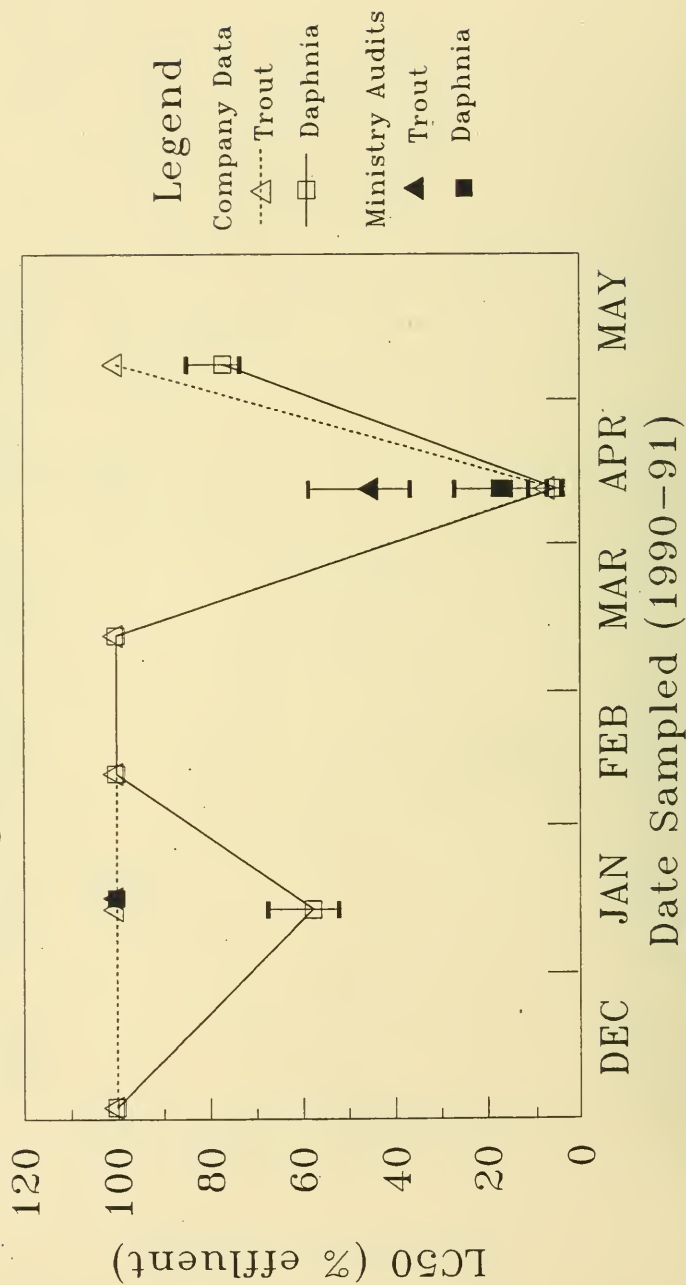
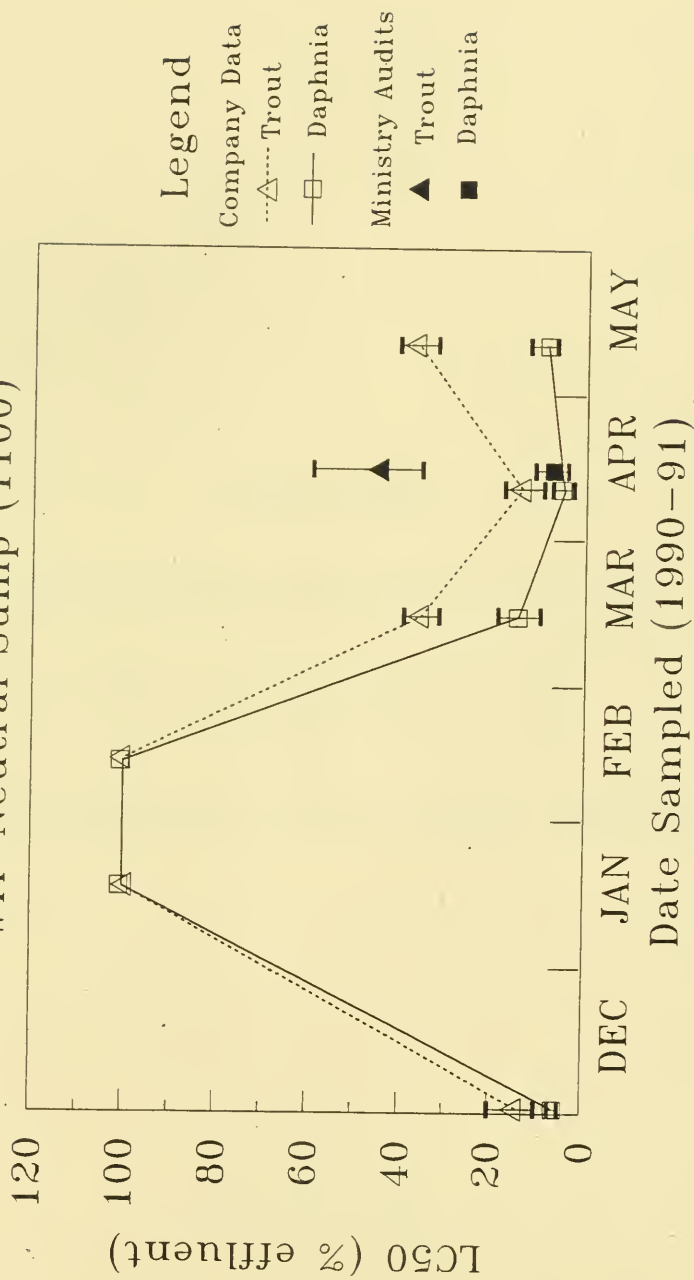


Figure 9.  
Darlington Construction  
WTP Neutral Sump (1100)





Appendix

Monitoring Data Summaries

For Companies In The

Electric Power Generation Sector





COMPANY: Decew Falls, Welland  
(49010200)  
SECTOR: Electric Power Generation  
REGION: West Central

#### SUMMARY

Rainbow trout acute lethality toxicity test data for two effluent and one Intake Water samples collected in February 1991 were submitted by Decew Falls of Welland.

The samples from CW-1 (200), CW-2 (300) and Intake Water (700) were all not acutely lethal to trout.

---

BE-Sump S1

CW-1

06910267 sampled: 02/18/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

CW-2

06910269 sampled: 02/18/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

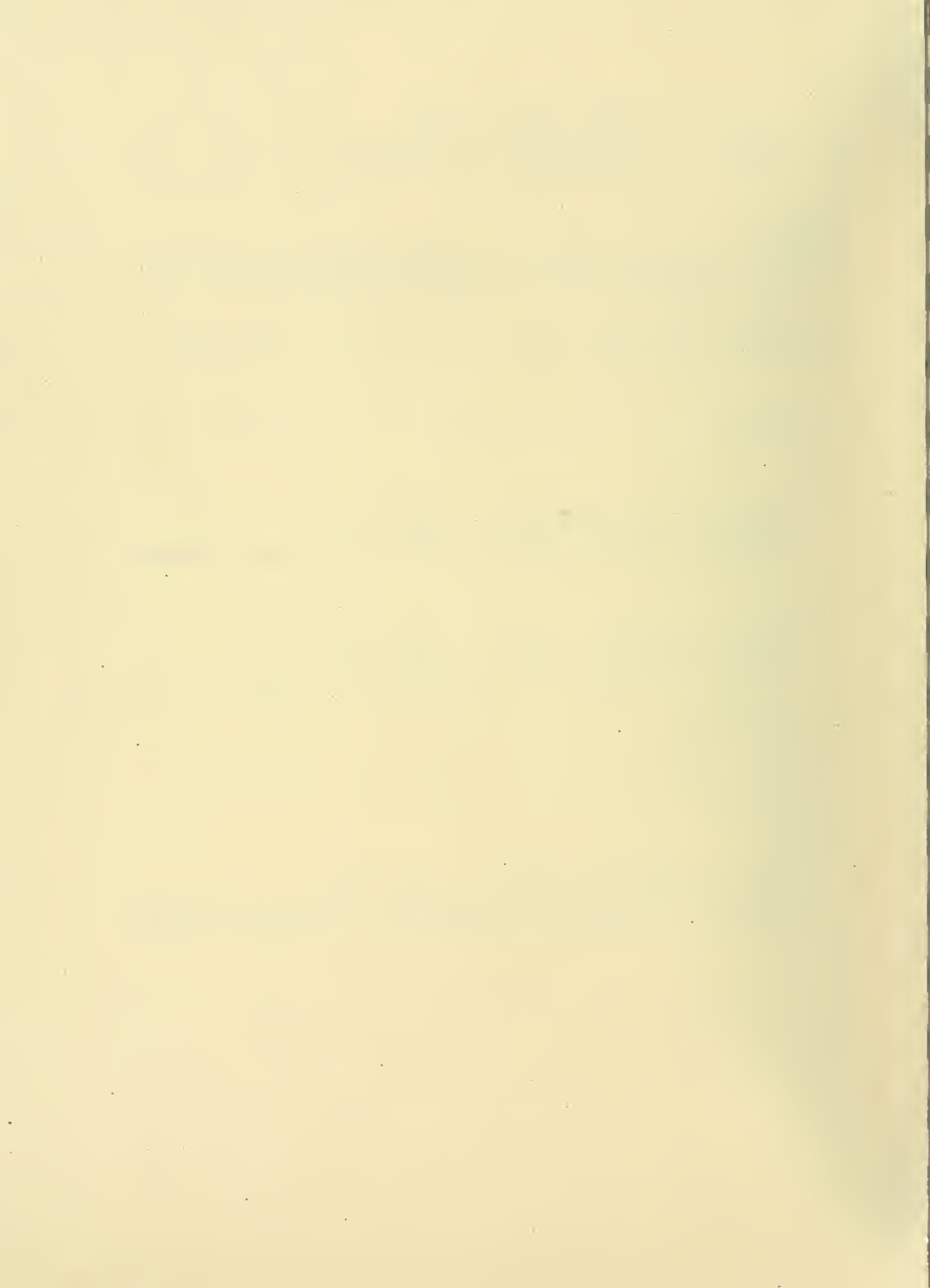
SW-Switchyard

SW-Transformer

Rain Gauge

Intake

06910265 sampled: 02/18/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED



COMPANY: Decew Falls, Welland  
(49010200)  
SECTOR: Electric Power Generation  
REGION: West Central

#### SUMMARY

Daphnia magna acute lethality toxicity test data for two effluent and one Intake Water samples collected in February 1991 were submitted by Decew Falls of Welland.

The sample of Intake Water (700) and the sample from CW-1 (200) were not acutely lethal to Daphnia. The sample from CW-2 (300) had an LC50 > 100% effluent.

---

BE-Sump S1

CW-1

06910268 sampled: 02/18/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

CW-2

06910270 sampled: 02/18/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 100%.

SW-Switchyard

SW-Transformer

Rain Gauge

Intake

06910266 sampled: 02/18/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS



COMPANY: Sir Adam Beck 2 GS, Queenston  
(1842004)  
SECTOR: Electric Power Generation  
REGION: West Central

#### SUMMARY

Rainbow trout acute lethality toxicity test data for four effluent and two Intake Water samples collected between December 1990 and May 1991 were submitted by Sir Adam Beck 2 Generating Station of Queenston.

All samples of Intake Water (1400), CW T15 (900) and CW T21 (1000) were not acutely lethal to trout.

---

BE Sump S11

BE Sump S13

BE Sump S15

BE Sump 17

BE Sump S19

BE Sump S21

BE Sump S23

BE Sump S25

CW T15

06910263 sampled: 02/18/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910890 sampled: 05/13/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

CW T21

06910259 sampled: 02/18/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910888 sampled: 05/13/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Sir Adam Beck 2 GS (continued)

SW Switchyard

SW Transformer

Rain Gauge

Intake

06910261 sampled: 02/18/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910892 sampled: 05/13/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

COMPANY: Sir Adam Beck 2 GS, Queenston  
(1842004)  
SECTOR: Electric Power Generation  
REGION: West Central

#### SUMMARY

Daphnia magna acute lethality toxicity test data for four effluent and two Intake Water samples collected between December 1990 and May 1991 were submitted by Sir Adam Beck 2 Generating Station of Queenston.

One of two samples of Intake Water (1400) was non-lethal. The sample collected in February was toxic to Daphnia with a 48 h LC50 = 77.0%.

One of two samples from CW T15 (900) was non-lethal and the other sample had an LC50 > 100% effluent.

Both samples from CW T21 (1000) had LC50s > 100% effluent.

---

BE Sump S11

BE Sump S13

BE Sump S15

BE Sump 17

BE Sump S19

BE Sump S21

BE Sump S23

BE Sump S25

CW T15

06910264 sampled: 02/18/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910891 sampled: 05/13/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 100%.

Sir Adam Beck 2 GS (continued)

CW T21

06910260 sampled: 02/18/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 65% & 100%.

06910889 sampled: 05/13/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 20% MORTALITY IN 100%

SW Switchyard

SW Transformer

Rain Gauge

Intake

06910262 sampled: 02/18/91 LC50: 77.0 %  
95% fid. limits: 63.6 - 105.0 % slope: 6.3  
comments: 80% MORTALITY IN 100%.

06910893 sampled: 05/13/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS



COMPANY: Atikokan - TGS, Atikokan  
(1842301)  
SECTOR: Electric Power Generation  
REGION:

#### SUMMARY

Rainbow trout acute lethality toxicity test data for 31 effluent and seven Intake Water samples collected between December 1990 and May 1991 were submitted by Atikokan Thermal Generating Station of Atikokan.

The seven Intake Water (1000) samples were non-lethal, as were the three samples of CCW-Outfall (100), and the seven samples from each of the Ash Transport System (200), Oily Water Separator (600), and the WTP-Neutral Sump (800). Ministry audit samples from collected from the Ash Transport System in February and May had LC50s > 100%. The two Ministry audits from the Oily Water Separator were both non-lethal. One of two audits from the WTP-Neutral Sump was non-lethal and the other had an LC50 > 100%.

One of seven samples of Boiler Blowdown (300) effluent was not acutely lethal to trout, and four samples had LC50s > 100%. Two samples were lethal to trout, and had 96 h LC50s of 88.4 and 77% effluent. A Ministry audit sample collected in May had an LC50 > 100%.

---

#### CCW-Outfall

04905391 sampled: 12/05/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

04910828 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04912217 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

#### Ash Transport System

04905392 sampled: 12/05/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

04905785 sampled: 12/19/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

Atikokan - TGS (continued)

04910501 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

03910099 sampled: 02/05/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 60 mg/L; MOE Audit

04910829 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04911169 sampled: 03/04/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04911681 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04912218 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

03910290 sampled: 05/14/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness 50 mg/l; MOE Audit

Boiler Blwdn

04905393 sampled: 12/05/90 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

04905786 sampled: 12/19/90 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

04910502 sampled: 01/28/91 LC50: 88.4 %  
95% fid. limits: 0.0 - 0.0 %  
comments: Confidence limits are unreliable

04910830 sampled: 02/11/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

04911170 sampled: 03/04/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: LC50 = 100%

Atikokan - TGS (continued)

04911682 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04912219 sampled: 05/06/91 LC50: 77.0 %  
95% fid. limits: 70.6 - 84.0 %  
comments:

03910289 sampled: 05/14/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness 0; MOE Audit

Coal Pile-Runoff

EO-Ash Tran System

Oily Water Separator

04905394 sampled: 12/05/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

04905787 sampled: 12/19/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

04910503 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

03910100 sampled: 02/05/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 50 mg/L; MOE Audit

04910831 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04911171 sampled: 03/04/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04911683 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04912220 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

Atikokan - TGS (continued)

03910288 sampled: 05/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness 20 mg/l; MOE Audit

SW-Yd Catch Basin

WTP-Neut.Sump

04905395 sampled: 12/05/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: conductivity of effluent: 10,140 uS/cm

04905789 sampled: 12/19/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

04910504 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

03910098 sampled: 02/05/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 140 mg/L; MOE Audit

04910832 sampled: 02/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04911172 sampled: 03/04/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04911684 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04912221 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

03910287 sampled: 05/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness 140 mg/l; MOE Audit

Rain Gauge

Atikokan - TGS (continued)

Intake Water

04905396	sampled: 12/05/90	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:	non-lethal	
04905790	sampled: 12/19/90	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:	non-lethal	
04910505	sampled: 01/28/91	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:	non-lethal	
04910833	sampled: 02/11/91	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:		
04911173	sampled: 03/04/91	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:		
04911685	sampled: 04/08/91	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:		
04912222	sampled: 05/06/91	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:		



COMPANY: Atikokan - TGS, Atikokan  
(1842301)  
SECTOR: Electric Power Generation  
REGION: Northwest

#### SUMMARY

Daphnia magna acute lethality toxicity test data for 30 effluent and four Intake Water samples collected between December 1990 and May 1991 were submitted by Atikokan Thermal Generating Station of Atikokan.

The four Intake Water (1000) samples were non-lethal, as were the three samples of CCW-Outfall (100).

Six of the seven samples from the Ash Transport System (200) were non-lethal. The sample collected on December 19 was toxic to Daphnia and had a 48 h LC50 = 86.6%. The Ministry audit sample collected in February had an LC50 > 100% and the sample collected in May was lethal, with a 48 h LC50 = 92.8%.

Six of seven samples from the Oily Water Separator (600) were not acutely lethal to Daphnia and one sample had an LC50 > 100%. The Ministry audit sample collected in February was non-lethal and the May sample had an LC50 > 100%.

Five of six samples from the WTP-Neutral Sump (800) had LC50s > 100%. The sample collected on December 5 was toxic to Daphnia and had a 48 h LC50 = 62.7%. One Ministry audit sample was non-lethal and the other had an LC50 > 100%.

All seven samples of Boiler Blowdown (300) effluent were acutely lethal to Daphnia. 48 h LC50s ranged between 38.2 and 89.8% effluent. A Ministry audit sample collected in May had an LC50 = 70.7% effluent.

---

#### CCW-Outfall

04905391 sampled: 12/05/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

04910828 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04912217 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

Atikokan - TGS (continued)

Ash Transport System

04905392 sampled: 12/05/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

04905785 sampled: 12/19/90 LC50: 86.6 %  
95% fid. limits: 0.0 - 0.0 %  
comments: confidence limits are unreliable

04910501 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

03910099 sampled: 02/05/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 60 mg/L; MOE Audit

04910829 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04911169 sampled: 03/04/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04911681 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04912218 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

03910290 sampled: 05/14/91 LC50: 92.8 %  
95% fid. limits: 74.2 - 115.8 % slope: 6.4  
comments: Effluent Hardness = 50 mg/L; MOE Audit

Boiler Blwdn

04905393 sampled: 12/05/90 LC50: 66.0 %  
95% fid. limits: 55.9 - 77.7 %  
comments:

04905786 sampled: 12/19/90 LC50: 44.2 %  
95% fid. limits: 0.0 - 0.0 %  
comments: Confidence limits are unreliable

04910502 sampled: 01/28/91 LC50: 66.0 %  
95% fid. limits: 55.9 - 77.7 %  
comments:



Atikokan - TGS (continued)

04910830 sampled: 02/11/91 LC50: 38.2 %  
95% fid. limits: 31.6 - 45.9 %  
comments:

04911170 sampled: 03/04/91 LC50: 89.8 %  
95% fid. limits: 67.3 - 119.6 %  
comments:

04911682 sampled: 04/08/91 LC50: 66.0 %  
95% fid. limits: 55.9 - 77.7 %  
comments:

04912219 sampled: 05/06/91 LC50: 40.1 %  
95% fid. limits: 32.6 - 49.2 %  
comments:

03910289 sampled: 05/14/91 LC50: 70.7 %  
95% fid. limits: 50.0 - 100.0 %  
comments: Effluent Hardness = 0 mg/L; MOE Audit

Coal Pile-Runoff

EO-Ash Tran System

Oily Water Separator

04905394 sampled: 12/05/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

04905787 sampled: 12/19/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

04910503 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

03910100 sampled: 02/05/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 50 mg/L; MOE Audit

04910831 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04911171 sampled: 03/04/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

Atikokan - TGS (continued)

04911683 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:  
04912220 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:  
03910288 sampled: 05/14/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 20 mg/L; MOE Audit

SW-Yd Catch Basin

WTP-Neut.Sump

04905395 sampled: 12/05/90 LC50: 62.7 %  
95% fid. limits: 52.8 - 74.4 %  
comments:  
04905789 sampled: 12/19/90 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:  
03910098 sampled: 02/05/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness =140mg/L; MOE Audit  
04910832 sampled: 02/14/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:  
04911172 sampled: 03/04/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:  
04911684 sampled: 04/08/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:  
04912221 sampled: 05/06/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:  
03910287 sampled: 05/14/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 140 mg/L; MOE Audit

Atikokan - TGS (continued)

Rain Gauge

Intake Water

04905790 sampled: 12/19/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

04910833 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04911685 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04912222 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:



COMPANY: Lakeview TGS, Mississauga  
(1843101)  
SECTOR: Electric Power Generation  
REGION: Central

#### SUMMARY

Rainbow trout acute lethality toxicity test data for 35 effluent and six Intake Water samples collected between December 1990 and May 1991 were submitted by Lakeview Thermal Generating Station of Mississauga.

The six samples of Cooling Water Intake (2900) were non-lethal, as were the two samples of CCW-Outfall (100), and six samples from the Oily Water Powerhouse (2300). A Ministry audit sample from the Oily Water powerhouse had an LC50 > 100%.

Four of six samples from the Ash Transport System (200) were not acutely lethal to trout and two samples had LC50s > 100%. A Ministry audit sample from this site was non-lethal to trout.

Two of six samples of Boiler Blowdown effluent from units U1 (900), U2 (1000), U3 (1100), and U4 (1200) were non-lethal, and three samples had LC50s > 100%. The sample collected from U4 in March was lethal to trout with a 96 h LC50 = 92.6%. Ministry audit samples collected from U3 and U4 in March were lethal to trout with LC50s of 80.6 and 86.4% effluent.

Eight of nine samples of Coal Pile Treated (1800) effluent were non-lethal. One sample collected in April was acutely lethal to trout and had a 96 h LC50 = 77.5%.

Five of six samples from the Oily Water Pumphouse (2400) were non-lethal and one sample had an LC50 > 100%. A Ministry audit sample collected in March had an LC50 > 100%.

A Ministry audit sample was collected from the WTP-Neutral Sump in March. This sample was lethal to trout and had a 96 h LC50 = 28.3%.

---

#### CCW-Outfall

06910032 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910641 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Lakeview TGS (continued)

Ash Transport System

06902010 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910028 sampled: 01/14/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 5% MORTALITY IN 100% CONCENTRATION

06910189 sampled: 02/11/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 65%.

03910150 sampled: 03/05/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 210 mg/L; MOE Audit

06910449 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910643 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910843 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

BE-U3

BE-U4

BE-U5

BE-U6

BE-U 1,2

BE-U 7,8

Boiler Blwdn-U1

06910181 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Lakeview TGS (continued)

Boiler Blwdn-U2

06910637 sampled: 04/08/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 100%.

Boiler Blwdn-U3

06910024 sampled: 01/14/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 20% MORTALITY IN 100% CONCENTRATION.

03910151 sampled: 03/05/91 LC50: 80.6 %  
95% fid. limits: 65.0 - 100.0 %  
comments: Effluent Hardness = 0 mg/L; MOE Audit

Boiler Blwdn-U4

06902016 sampled: 12/03/90 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 30% MORTALITY IN 100% TEST CONCENTRATION.

03910152 sampled: 03/05/91 LC50: 86.4 %  
95% fid. limits: 76.1 - 98.1 % slope: 13.3  
comments: Effluent Hardness = 0 mg/L; MOE Audit

06910451 sampled: 03/11/91 LC50: 92.6 %  
95% fid. limits: 89.0 - 97.6 %  
comments: CONDUCTIVITY METERS CHANGED DURING TESTING.

06910818 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Boiler Blwdn-U5

Boiler Blwdn-U6

Boiler Blwdn-U7

Boiler Blwdn-U8

Raw Coal Pile Roff

Coal Pile Treated

06902152 sampled: 12/25/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Lakeview TGS (continued)

06902158 sampled: 12/30/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910277 sampled: 02/18/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910419 sampled: 03/05/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: CONDUCTIVITY METERS CHANGED DURING TESTING.

06910455 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910582 sampled: 03/29/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910681 sampled: 04/10/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910714 sampled: 04/15/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910796 sampled: 04/23/91 LC50: 77.5 %  
95% fid. limits: 71.6 - 83.8 %  
comments: COMPLETE MORTALITY IN 100%.

EC-Boiler Acid Cl.

Ec-Air Ph Washing

EO-Ash Filt. Pl-E

EO-Coal Pile

Oily Water Pwrhse

06902012 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910022 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED



Lakeview TGS (continued)

06910185 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

03910148 sampled: 03/05/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 60 mg/L; MOE Audit

06910445 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910645 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910822 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Oily Water Pumphouse

06902014 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910026 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910183 sampled: 02/11/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 5% MORTALITY IN 100%.

03910147 sampled: 03/05/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 130 mg/L; MOE Audit

06910447 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910639 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910824 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Lakeview TGS (continued)

SW-S. Yd Drain

SW-N. Yd Drain

WTP-Neut. Sump

03910149 sampled: 03/05/91 LC50: 28.3 %  
95% fid. limits: 20.0 - 40.0 %  
comments: Effluent Hardness = 50 mg/L; MOE Audit

Rain Gauge

Cooling Water Intake

06902008 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910030 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910187 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910453 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910635 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910820 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

BE-U 5-8 PH Sump

Chlor Cool Wat-U1

Chlor Cool Wat-U2

Chlor Cool Wat-U3

Lakeview TGS (continued)

Chlor Cool Wat-U4

Chlor Cool Wat-U5

Chlor Cool Wat-U6

Chlor Cool Wat-U7

Chlor Cool Wat-U8

EO-Ash Filt Pl-W



COMPANY: Lakeview TGS, Mississauga  
(1843101)  
SECTOR: Electric Power Generation  
REGION: Central

#### SUMMARY

Daphnia magna acute lethality toxicity test data for 35 effluent and six Intake Water samples collected between December 1990 and May 1991 were submitted by Lakeview Thermal Generating Station of Mississauga.

Four of six samples of Cooling Water Intake (2900) were non-lethal, and two samples had LC50s > 100%.

Both samples from CCW-Outfall (100) were not acutely lethal to Daphnia.

Five of six samples from the Ash Transport System (200) were not acutely lethal to Daphnia and one sample had an LC50 > 100%. A Ministry audit sample from this site was non-lethal.

All six samples of Boiler Blowdown effluent from units U1 (900), U2 (1000), U3 (1100), and U4 (1200) were lethal to Daphnia. 48 h LC50s ranged between 43.5 and 72.7% effluent. Ministry audit samples collected from U3 and U4 in March were lethal to Daphnia with LC50s of 70.7% effluent.

Eight of nine samples of Coal Pile Treated (1800) effluent were non-lethal. One sample collected in April had a LC50 > 100%.

Two of six samples from the Oily Water Powerhouse (2300) were non-lethal and one sample had an LC50 > 100%. Three samples were acutely lethal to Daphnia with 48 h LC50s ranging between 60.4 and 100% effluent. A Ministry audit sample from this outfall had an LC50 = 63.7%. Two of six samples from the Oily Water Pumphouse (2400) were non-lethal and four samples had an LC50 > 100%. A Ministry audit sample collected in March had an LC50 > 100%.

A Ministry audit sample was collected from the WTP-Neutral Sump in March. This sample was lethal to Daphnia and had a 48 h LC50 = 16.1% effluent.

---

Lakeview TGS (continued)

CCW-Outfall

06910033 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910642 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Ash Transport System

06902011 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910029 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910190 sampled: 02/11/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 50% CONCENTRATION.

03910150 sampled: 03/05/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 210 mg/L; MOE Audit

06910450 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910644 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910844 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

BE-U3

BE-U4

BE-U5

Lakeview TGS (continued)

BE-U6

BE-U 1,2

BE-U 7,8

Boiler Blwdn-U1

06910182 sampled: 02/11/91 LC50: 61.6 %  
95% fid. limits: 51.4 - 75.6 %  
comments: 70% MORTALITY IN 65% CONCENTRATION.

Boiler Blwdn-U2

06910638 sampled: 04/08/91 LC50: 43.5 %  
95% fid. limits: 38.9 - 48.6 %  
comments: 70% MORTALITY IN 50%.

Boiler Blwdn-U3

06910025 sampled: 01/14/91 LC50: 72.7 %  
95% fid. limits: 65.7 - 80.3 %  
comments: 30% MORTALITY IN 65% TEST CONCENTRATION.

03910151 sampled: 03/05/91 LC50: 70.7 %  
95% fid. limits: 50.0 - 100.0 %  
comments: Effluent Hardness = 0 mg/L; MOE Audit

Boiler Blwdn-U4

06902017 sampled: 12/03/90 LC50: 65.5 %  
95% fid. limits: 58.8 - 72.9 %  
comments: 60% MORTALITY IN 65% TEST CONCENTRATION.

03910152 sampled: 03/05/91 LC50: 70.7 %  
95% fid. limits: 50.0 - 100.0 %  
comments: Effluent Hardness = 0 mg/L; MOE Audit

06910452 sampled: 03/11/91 LC50: 72.7 %  
95% fid. limits: 65.7 - 80.3 %  
comments: 30% MORTALITY IN THE 65% CONCENTRATION

06910819 sampled: 05/06/91 LC50: 72.7 %  
95% fid. limits: 65.7 - 80.3 %  
comments: 30% MORTALITY IN 65%.

Lakeview TGS (continued)

Boiler Blwdn-U5

Boiler Blwdn-U6

Boiler Blwdn-U7

Boiler Blwdn-U8

Raw Coal Pile Roff

Coal Pile Treated

06902153 sampled: 12/25/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06902159 sampled: 12/30/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910278 sampled: 02/18/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910420 sampled: 03/05/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910456 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910583 sampled: 03/29/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910682 sampled: 04/10/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910715 sampled: 04/15/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910797 sampled: 04/23/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 30% MORTALITY IN 100%.



Lakeview TGS (continued)

EC-Boiler Acid Cl.

Ec-Air Ph Washing

EO-Ash Filt. Pl-E

Eo-Coal Pile

Oily Water Pwrhse

06902013 sampled: 12/03/90 LC50: 72.7 %  
95% fid. limits: 65.7 - 80.3 %  
comments: COMPLETE MORTALITY IN 100% CONCENTRATION.

06910023 sampled: 01/14/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: PARTIAL MORTALITY IN 10,50 & 100%.

06910186 sampled: 02/11/91 LC50: 100.0 %  
95% fid. limits: 99.9 - 65.0 %  
comments: 50% MORTALITY IN 100% CONCENTRATION.

03910148 sampled: 03/05/91 LC50: 63.7 %  
95% fid. limits: 48.5 - 83.4 % slope: 5.8  
comments: Effluent Hardness = 60 mg/L; MOE Audit

06910446 sampled: 03/11/91 LC50: 60.4 %  
95% fid. limits: 51.3 - 72.1 %  
comments: PARTIAL MORTALITY IN THE 50% AND 65% CONC.

06910646 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910823 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Oily Water Pumphouse

06902015 sampled: 12/03/90 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 40% MORTALITY IN 100% TEST CONCENTRATION.

06910027 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910184 sampled: 02/11/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 10% CONCENTRATION.

Lakeview TGS (continued)

03910147 sampled: 03/05/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 130 mg/L; MOE Audit

06910448 sampled: 03/11/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY AT FULL STRENGTH EFFLUENT

06910640 sampled: 04/08/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 100%.

06910825 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

SW-S. Yd Drain

SW-N. Yd Drain

WTP-Neut. Sump

03910149 sampled: 03/05/91 LC50: 16.1 %  
95% fid. limits: 11.9 - 23.1 % slope: 3.9  
comments: Effluent Hardness = 50 mg/L; MOE Audit

Rain Gauge

Cooling Water Intake

06902009 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910031 sampled: 01/14/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 65% TEST CONCENTRATION.

06910188 sampled: 02/11/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 100% CONCENTRATION.

06910454 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910636 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Lakeview TGS (continued)

06910821 sampled: 05/06/91 non-lethal

95% fid. limits: 0.0 - 0.0 %

comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

BE-U 5-8 PH Sump

Chlor Cool Wat-U1

Chlor Cool Wat-U2

Chlor Cool Wat-U3

Chlor Cool Wat-U4

Chlor Cool Wat-U5

Chlor Cool Wat-U6

Chlor Cool Wat-U7

Chlor Cool Wat-U8

EO-Ash Filt Pl-W



COMPANY: Lambton TGS, Courtright  
(1841204)  
SECTOR: Electric Power Generation  
REGION: Southwest

#### SUMMARY

Rainbow trout acute lethality toxicity test data for 24 effluent and 6 Intake Water samples collected between December 1990 and May 1991 were submitted by Lambton Thermal Generating Station of Courtright.

Five of six Intake Water (100) samples were non-lethal and one sample had an LC50 > 100%.

The six samples from each of the Ash Transport System (800) and CP-Lake Lambton (1100) were not acutely lethal to trout. Ministry audit samples collected from these sites in December were also non-lethal.

The two samples from the CCW-Outfall (200) and CW-N Yd (1300), and one from the Unit 2 Transformer (1800) were not acutely lethal to trout.

Two of seven Boiler Blowdown samples from units U1 (400), U2 (500), U3 (600), and U4 (700) were non-lethal and three samples had LC50s > 100%. Two samples were acutely lethal to trout and had 96 h LC50s of 97.6 and 87% effluent. A Ministry audit sample collected in December was non-lethal.

A Ministry audit sample was collected from the PE-Neutral Sump (1200) in December. This sample was not acutely lethal to trout.

---

#### Intake Water

06902080 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910113 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910315 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910530 sampled: 03/25/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 5% MORTALITY IN 100%.

Lambton TGS (continued)

06910754 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910973 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

CCW-Outfall

06910121 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910760 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

EO-Ash Filt Plant

Boiler Blwdn-U1

06910628 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Boiler Blwdn-U2

06902084 sampled: 12/10/90 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 20% MORTALITY IN 100% TEST CONCENTRATION.

01900276 sampled: 12/12/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA Audit

06910117 sampled: 01/28/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 50% MORTALITY IN 100%.

06910319 sampled: 02/25/91 LC50: 97.6 %  
95% fid. limits: 90.0 - 99.9 %  
comments: 70% MORTALITY IN 100%.

Boiler Blwdn-U3

06910977 sampled: 05/27/91 LC50: 87.0 %  
95% fid. limits: 83.2 - 91.5 %  
comments: 60% MORTALITY IN 90%.

Lambton TGS (continued)

Boiler Blwdn-U4

06910534 sampled: 03/25/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 100%.

06910764 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Ash Transport System

06902082 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

01900274 sampled: 12/12/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA Audit

06910115 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910317 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910532 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910756 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910975 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

BE-N Building Drain

C P Effl B'man Pit

C P-Lake Lambton

06902086 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Lambton TGS (continued)

01900275 sampled: 12/12/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA Audit

06910119 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910321 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910536 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910758 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910979 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

PE-Neut Sump

01900273 sampled: 12/12/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA Audit

CW-N Yd

06910123 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910762 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

EC-Air Ph Wash

EC-Boiler Wsh/Clean

SW-N Yd



Lambton TGS (continued)

Rain Gauge

Unit 2 Transformer

06910125 sampled: 01/28/91 non-lethal

95% fid. limits: 0.0 - 0.0 %

comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

BE-Admin Pumphouse

BE-U 1 & 2 Phouse

BE-U 3 & 4 Phouse

Coal Yd Maint GAR

Chlorination-U 1

Chlorination - U 2

Chlorination - U 3

Chlorination - U 4



COMPANY: Lambton TGS, Courtright  
(1841204)  
SECTOR: Electric Power Generation  
REGION: Southwest

#### SUMMARY

Daphnia magna acute lethality toxicity test data for 24 effluent and 6 Intake Water samples collected between December 1990 and May 1991 were submitted by Lambton Thermal Generating Station of Courtright.

The six Intake Water (100) samples were non-lethal, as were the six samples from the Ash Transport System (800), two samples from each of the CCW-Outfall (200) and CW-N Yd (1300), and one from the Unit 2 Transformer (1800). A Ministry audit sample from the Ash Transport System was also non-lethal.

Five of six samples from C P-Lake Lambton (1100) were not acutely lethal to Daphnia and one sample had an LC50 > 100%. A Ministry audit sample collected from this site in December was non-lethal.

All seven Boiler Blowdown samples from units U1 (400), U2 (500), U3 (600), and U4 (700) were lethal to Daphnia. 48 h LC50s ranged between 36.9 and 80.6% effluent. The Ministry audit sample collected in December was non-lethal.

A Ministry audit sample was collected from the PE-Neutral Sump (1200) in December. This sample was not acutely lethal to Daphnia.

---

#### Intake Water

06902081	sampled: 12/10/90	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:	NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS	
06910114	sampled: 01/28/91	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:	NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS	
06910316	sampled: 02/25/91	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:	NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS	
06910531	sampled: 03/25/91	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:	NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS	

Lambton TGS (continued)

06910755 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910974 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

CCW-Outfall

06910122 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910761 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

EO-Ash Filt Plant

Boiler Blwdn-U1

06910630 sampled: 04/08/91 LC50: 77.9 %  
95% fid. limits: 72.9 - 83.2 %  
comments: 10% MORTALITY IN 65%.

Boiler Blwdn-U2

06902085 sampled: 12/10/90 LC50: 77.9 %  
95% fid. limits: 72.9 - 83.2 %  
comments: COMPLETE MORTALITY IN 100% CONCENTRATION.

02900276 sampled: 12/12/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA Audit

06910118 sampled: 01/28/91 LC50: 80.6 %  
95% fid. limits: 65.0 - 100.0 %  
comments: COMPLETE MORTALITY IN 100%.

06910320 sampled: 02/25/91 LC50: 80.6 %  
95% fid. limits: 65.0 - 100.0 %  
comments: COMPLETE MORTALITY IN 100%.

Boiler Blwdn-U3

06910978 sampled: 05/27/91 LC50: 36.9 %  
95% fid. limits: 31.1 - 43.4 %  
comments: 50% MORTALITY IN 30%.

Lambton TGS (continued)

Boiler Blwdn-U4

06910535 sampled: 03/25/91 LC50: 56.4 %  
95% fid. limits: 46.3 - 68.0 %  
comments: 20% MORTALITY IN 50%.

06910765 sampled: 04/22/91 LC50: 63.3 %  
95% fid. limits: 57.2 - 69.9 %  
comments: 70% MORTALITY IN 65%.

Ash Transport System

06902083 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

02900274 sampled: 12/12/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA Audit

06910116 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910318 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910533 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910757 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910976 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

BE-N Building Drain

C P Effl B'man Pit

C P-Lake Lambton

06902087 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Lambton TGS (continued)

02900275 sampled: 12/12/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA Audit; High Conductivity

06910120 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910322 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910537 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910759 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910980 sampled: 05/27/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 100%.

PE-Neut Sump

02900273 sampled: 12/12/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA Audit

CW-N Yd

06910124 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910763 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

EC-Air Ph Wash

EC-Boiler Wsh/Clean

SW-N Yd

Lambton TGS (continued)

Rain Gauge

Unit 2 Transformer

06910126 sampled: 01/28/91 non-lethal

95% fid. limits: 0.0 - 0.0 %

comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

BE-Admin Pumphouse

BE-U 1 & 2 Phouse

BE-U 3 & 4 Phouse

Coal Yd Maint GAR

Chlorination-U 1

Chlorination - U 2

Chlorination - U 3

Chlorination - U 4





COMPANY:   Lennox TGS, South Fredericksberg  
          (1843309)  
SECTOR:    Electric Power Generation  
REGION:     Southeast

#### SUMMARY

Rainbow trout acute lethality toxicity test data for 18 effluent and five Intake Water samples collected between December 1990 and May 1991 were submitted by Lennox Thermal Generating Station of South Fredericksberg.

All five Intake Water (2000) samples were non-lethal, as were the five samples from the PE-WTP Neut. S SP (2300) and the single samples collected from the CW-CCW Outfall (200), CW-U 1,2 Trans Cool (1500) and CW-U 3,4 Trans Cool (1600).

Three of five samples from the PE-Oily Water TP Discharge (300) were not acutely lethal to trout and two samples had 96 h LC50s > 100%.

Two of five samples of Boiler Blowdown effluent from Units U2 (1200) and U4 (1400) were non-lethal, and two samples had LC50s > 100%. One sample collected from U2 in December was lethal to trout and had a 96 h LC50 = 96.7% effluent.

---

#### CW-CCW Outfall

06910655   sampled: 04/08/91       non-lethal  
          95% fid. limits:   0.0 -   0.0 %  
          comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

#### PE-Oily Wat TP Dis

06902032   sampled: 12/03/90       non-lethal  
          95% fid. limits:   0.0 -   0.0 %  
          comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910207   sampled: 02/11/91       non-lethal  
          95% fid. limits:   0.0 -   0.0 %  
          comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910457   sampled: 03/11/91       LC50: >100 %  
          95% fid. limits:   0.0 -   0.0 %  
          comments: 5% MORTALITY IN FULL STRENGTH EFFLUENT.

06910657   sampled: 04/08/91       non-lethal  
          95% fid. limits:   0.0 -   0.0 %  
          comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910830   sampled: 05/06/91       LC50: >100 %  
          95% fid. limits:   0.0 -   0.0 %  
          comments: 10% MORTALITY IN 50%.

Lennox TGS (continued)

BE-Pumphouse Sump

BE-U1 Sump

BE-U2 Sump

BE-U3 Sump

BE-U4 Sump

Boiler Blwdn-U1

Boiler Blwdn-U2

06902030 sampled: 12/03/90 LC50: 96.7 %  
95% fid. limits: 90.0 - 99.9 %  
comments: UPPER CONFIDENCE LIMIT CAN NOT BE CALCULATED

06910205 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06911021 sampled: 05/28/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 20% MORTALITY IN 100%

Boiler Blwdn-U3

Boiler Blwdn-U4

06910569 sampled: 03/25/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 20% MORTALITY IN 100%.

06910725 sampled: 04/15/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

CW-U 1,2 Trans Cool

06910653 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

CW-U 3,4 Trans Cool

06910651 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Lennox TGS (continued)

EC-Air Ph Wash Lag

EC-Boiler Wsh/Clean

Rain Gauge

Intake Water

06902026 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910201 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910459 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910649 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910826 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SW-W Yd Drainage

SW-E Yd Drainage

PE-WTP Neut. S SP

06902028 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910203 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910461 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: CONDUCTIVITY METERS CHANGED DURING TESTING.

06910647 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Lennox TGS (continued)

06910828 sampled: 05/06/91 non-lethal

95% fid. limits: 0.0 - 0.0 %

comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

COMPANY: Lennox TGS, South Fredericksberg  
(1843309)  
SECTOR: Electric Power Generation  
REGION: Southeast

#### SUMMARY

Daphnia magna acute lethality toxicity test data for 24 effluent and 6 Intake Water samples collected between December 1990 and May 1991 were submitted by Lennox Thermal Generating Station of South Fredericksberg.

All six Intake Water (2000) samples were non-lethal.

Two samples were collected from each of the CW-CCW Outfall (200), CW-U 1,2 Trans Cool (1500) and CW-U 3,4 Trans Cool (1600). Both samples from CW-CCW Outfall and CW-U 3,4 Trans Cool were not acutely lethal to Daphnia. One of two samples from the CW-U 1,2 Trans Cool was non-lethal and the other sample had a 48 h LC50 > 100%.

Five of six samples from the PE-WTP Neut. S SP (2300) and the PE-Oily Water TP Discharge (300) were not acutely lethal to Daphnia and one sample from each had 96 h LC50s > 100%.

All six samples from Boiler Blowdown Units U1 (1100), U2 (1200) and U4 (1400) were acutely lethal to Daphnia with 48 h LC50s ranging between 54.9 and 80.6% effluent.

---

#### CW-CCW Outfall

06910057 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910656 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

#### PE-Oily Wat TP Dis

06902033 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910069 sampled: 01/21/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 20% MORTALITY IN 100% CONCENTRATION.

06910208 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Lennox TGS (continued)

06910458 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910658 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910831 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

BE-Pumphouse Sump

BE-U1 Sump

BE-U2 Sump

BE-U3 Sump

BE-U4 Sump

Boiler Blwdn-U1

06910059 sampled: 01/14/91 LC50: 80.6 %  
95% fid. limits: 65.0 - 100.0 %  
comments: COMPLETE MORTALITY IN 100% CONCENTRATION.

Boiler Blwdn-U2

06902031 sampled: 12/03/90 LC50: 54.9 %  
95% fid. limits: 50.9 - 59.0 %  
comments: 100% MORTALITY IN 65% TEST CONCENTRATION.

06910206 sampled: 02/11/91 LC50: 80.6 %  
95% fid. limits: 65.0 - 100.0 %  
comments: COMPLETE MORTALITY IN 100%.

06911022 sampled: 05/28/91 LC50: 80.6 %  
95% fid. limits: 65.0 - 100.0 %  
comments: 100% MORTALITY IN THE 100% CONCENTRATION

Boiler Blwdn-U3

Boiler Blwdn-U4

06910570 sampled: 03/25/91 LC50: 80.6 %  
95% fid. limits: 65.0 - 100.0 %  
comments: COMPLETE MORTALITY IN 100%.

Lennox TGS (continued)

06910726 sampled: 04/15/91 LC50: 80.6 %  
95% fid. limits: 65.0 - 100.0 %  
comments: COMPLETE MORTALITY IN 100%.

CW-U 1,2 Trans Cool

06910053 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910654 sampled: 04/08/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 100%.

CW-U 3,4 Trans Cool

06910055 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910652 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

EC-Air Ph Wash Lag

EC-Boiler Wsh/Clean

Rain Gauge

Intake Water

06902027 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910051 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910202 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910460 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910650 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS



Lennox TGS (continued)

06910827 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

SW-W Yd Drainage

SW-E Yd Drainage

PE-WTP Neut. S SP

06902029 sampled: 12/03/90 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 100% TEST CONCENTRATION.

06910049 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910204 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910462 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910648 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910829 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS



COMPANY: Nanticoke TGS, Nanticoke  
(1840008)  
SECTOR: Electric Power Generation  
REGION: West Central

#### SUMMARY

Rainbow trout acute lethality toxicity test data for 21 effluent and six Intake Water samples collected between December 1990 and May 1991 were submitted by Nanticoke Thermal Generating Station of Nanticoke.

All six Intake Water (2000) samples were non-lethal, as were the two samples from the CW-CCW Outfall (200). A Ministry audit sample collected from the CW-CCW Outfall in January was also non-lethal.

Four of six samples from the Ash Transport Line (300) were not acutely lethal to trout and two samples had 96 h LC50s > 100%. A Ministry audit sample collected in January was non-lethal. All six samples from the Ash Lagoon (100) were lethal to trout, with 96 h LC50s ranging between 21.9 and 80.6% effluent. A Ministry audit sample collected in January was also lethal and had an LC50 = 51%.

Boiler Blowdown effluents from units U2 (1300), U3 (1400), U4 (1500), and U8 (1900) were lethal to trout. 96 h LC50s ranged between 80.8 and 95.9% effluent for these five samples. Samples from units U6 (1700) and U7 (1800) were non-lethal. A Ministry audit sample from unit U5 (1600) had an LC50 > 100%, and a sample from U6 was non-lethal.

---

#### Ash lagoon

06902074	sampled: 12/10/90	LC50:	80.6 %
	95% fid. limits:	65.0 - 100.0 %	
	comments:	COMPLETE MORTALITY IN 100% TEST CONCENTRATION	
03910015	sampled: 01/08/91	LC50:	51.0 %
	95% fid. limits:	40.0 - 65.0 %	
	comments:	MISA Audit; Sample; Hardness - 480 mg/L	
06910107	sampled: 01/28/91	LC50:	75.2 %
	95% fid. limits:	68.9 - 82.1 %	
	comments:	20% MORTALITY IN 65%.	
06910331	sampled: 02/25/91	LC50:	37.8 %
	95% fid. limits:	32.3 - 44.1 %	
	comments:	30% MORTALITY IN 30%.	
06910540	sampled: 03/25/91	LC50:	14.1 %
	95% fid. limits:	10.0 - 20.0 %	
	comments:	COMPLETE MORTALITY IN 20%.	

Nanticoke TGS (continued)

06910770 sampled: 04/22/91 LC50: 21.9 %  
95% fid. limits: 19.1 - 25.2 %  
comments: COMPLETE MORTALITY IN 30%.

06910989 sampled: 05/27/91 LC50: 25.9 %  
95% fid. limits: 19.6 - 33.8 % slope: 4.9  
comments: 60% MORTALITY IN 30%.

CCW - Outfall

03910013 sampled: 01/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA Audit; Hardness - 80 mg/L

06910105 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910774 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Ash Transport Line

06902076 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

03910016 sampled: 01/09/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA Audit; Hardness - 330 mg/L

06910109 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910333 sampled: 02/25/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 100%.

06910542 sampled: 03/25/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 50,65,&100%.

06910766 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910991 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Nanticoke TGS (continued)

BE Unit 1 MH # 15

BE Unit 2 MH #14

BE Unit 3 MH #13

BE Unit 4 MH # 12

BE Unit 5, Sump 5

BE Unit 6 Sump 6

BE Unit 7, Sump 7

BE Unit 8 Sump 8

BE Pumphouse Unit 1,2

BE Pumphouse Unit 3,4

BE Pumphouse Unit 5,6

BE Pumphouse Unit 7,8

Boiler Blwdn Unit 1

Boiler Blwdn Unit 2

06910544 sampled: 03/25/91 LC50: 80.8 %  
95% fid. limits: 77.0 - 85.0 %  
comments: 50% MORTALITY IN 80%.

Boiler Blwdn Unit 3

06910546 sampled: 03/25/91 LC50: 87.5 %  
95% fid. limits: 83.7 - 92.2 %  
comments: 40% MORTALITY IN 90%.

Boiler Blwdn Unit 4

06902078 sampled: 12/10/90 LC50: 93.7 %  
95% fid. limits: 91.6 - 95.9 %  
comments: COMPLETE MORTALITY IN 100% TEST CONCENTRATION

Boiler Blwdn Unit 5

03910014 sampled: 01/08/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: MOE Audit Sample; Hardness - 0 mg/L

Nanticoke TGS (continued)

Boiler Blwdn Unit 6

06910017 sampled: 01/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA Audit; Hardness - 0 mg/l

06910111 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Boiler Blwdn Unit 7

06910772 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Boiler Blwdn Unit 8

06910335 sampled: 02/25/91 LC50: 95.9 %  
95% fid. limits: 90.0 - 100.0 %  
comments: 90% MORTALITY IN 100%.

06910993 sampled: 05/27/91 LC50: 85.8 %  
95% fid. limits: 84.0 - 87.6 %  
comments: 90% MORTALITY IN 90%.

Coal Pile Runoff NE Sump

Coal Pile Runoff NW Sump

EC Boiler Acid Wash Unit1

EC Boiler Acid Wash Unit2

EC Boiler Acid Wash Unit3

EC Boiler Acid Wash Unit4

EC Boiler Acid Wash Unit5

EC Boiler Acid Wash Unit6

EC Boiler Acid Wash Unit7

EC Boiler Acid Wash Unit8

Nanticoke TGS (continued)

EC Ext Boiler Wash Unit 1  
EC Ext Boiler Wash Unit 2  
EC Ext Boiler Wash Unit 3  
EC Ext Boiler Wash Unit 4  
EC Ext Boiler Wash Unit 5  
EC Ext Boiler Wash Unit 6  
EC Ext Boiler Wash Unit 7  
EC Ext Boiler Wash Unit 8  
EC Preheater Wash Unit 12  
EC Preheater Wash Unit 34  
EC Preheater Wash Unit 56  
EC Preheater Wash Unit 78  
Emergency Overflow  
EO Hydrovac Unit 12  
EO Hydrovac Unit 34  
EO Hydrovac Unit 56  
EO Hydrovac Unit 78  
EO Ash Lagoon  
EO Dust Supression Pumphs  
SW-East  
SW-South  
SW-West  
SW Truck Wash Station

Nanticoke TGS (continued)

WTP-Neut. Sump

Rain Gauge

Intake Water

06902072 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910103 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910329 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910538 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910768 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910987 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

TRO-Unit 1

TRO-Unit 2

TRO-Unit 3

TRO-Unit 4

TRO-Unit 5

TRO-Unit 6

TRO-Unit 7

TRO-Unit 8

Nanticoke TGS (continued)





COMPANY: Nanticoke TGS, Nanticoke  
(1840008)  
SECTOR: Electric Power Generation  
REGION: West Central

#### SUMMARY

Daphnia magna acute lethality toxicity test data for 21 effluent and 6 Intake Water samples collected between December 1990 and May 1991 were submitted by Nanticoke Thermal Generating Station of Nanticoke.

All six Intake Water (2000) samples were non-lethal, as were the two samples from the CW-CCW Outfall (200). A Ministry audit sample collected from the CW-CCW Outfall in January was acutely lethal to Daphnia with a 48 h LC50 = 6.7%.

All six samples from the Ash Transport Line (300) were not acutely lethal to Daphnia. A Ministry audit sample collected in January was also non-lethal. Five of six samples from the Ash Lagoon (100) were lethal to Daphnia, with 48 h LC50s ranging between 38.7 and 80.6% effluent. One sample was non-lethal. A Ministry audit sample collected in January was lethal and had an LC50 = 31.2%.

All seven Boiler Blowdown effluents from units U2 (1300), U3 (1400), U4 (1500), U6 (1700), U7 (1800) and U8 (1900) were toxic to Daphnia. 48 h LC50s ranged between 34.4 and 84.4% effluent for these samples. Ministry audit samples collected from units U5 (1600) and U6 were also toxic to Daphnia with LC50s between 67.1 and 70.7% effluent.

---

#### Ash lagoon

06902075 sampled: 12/10/90 LC50: 80.6 %  
95% fid. limits: 65.0 - 100.0 %  
comments: COMPLETE MORTALITY IN 100% CONCENTRATION.

03910015 sampled: 01/08/91 LC50: 31.2 %  
95% fid. limits: 15.2 - 123.9 % slope: 1.4  
comments: MOE Audit Sample; Hardness - 480 mg/l

06910108 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910332 sampled: 02/25/91 LC50: 50.6 %  
95% fid. limits: 44.0 - 66.0 %  
comments: 40% MORTALITY IN 50%.

06910541 sampled: 03/25/91 LC50: 38.7 %  
95% fid. limits: 30.0 - 50.0 %  
comments: COMPLETE MORTALITY IN 50%.

Nanticoke TGS (continued)

06910771 sampled: 04/22/91 LC50: 45.2 %  
95% fid. limits: 40.1 - 50.9 %  
comments: 60% MORTALITY IN 50% CONCENTRATION.

06910990 sampled: 05/27/91 LC50: 50.8 %  
95% fid. limits: 45.4 - 56.8 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED

CCW - Outfall

03910013 sampled: 01/08/91 LC50: 6.7 %  
95% fid. limits: 0.0 - 13.2 % slope: 1.5  
comments: MOE Audit Sample; TH = 80 mg/l; floaters

06910106 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910775 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Ash Transport Line

06902077 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

03910016 sampled: 01/09/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MOE Audit Sample; Hardness - 330 mg/L

06910110 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910334 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910543 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910767 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910992 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED

Nanticoke TGS (continued)

BE Unit 1 MH # 15

BE Unit 2 MH #14

BE Unit 3 MH #13

BE Unit 4 MH # 12

BE Unit 5, Sump 5

BE Unit 6 Sump 6

BE Unit 7, Sump 7

BE Unit 8 Sump 8

BE Pumphouse Unit 1,2

BE Pumphouse Unit 3,4

BE Pumphouse Unit 5,6

BE Pumphouse Unit 7,8

Boiler Blwdn Unit 1

Boiler Blwdn Unit 2

06910545 sampled: 03/25/91 LC50: 63.3 %  
95% fid. limits: 57.2 - 69.9 %  
comments: 70% MORTALITY IN 65%.

Boiler Blwdn Unit 3

06910547 sampled: 03/25/91 LC50: 50.6 %  
95% fid. limits: 44.1 - 57.9 %  
comments: 40% MORTALITY IN 50%.

Boiler Blwdn Unit 4

06902079 sampled: 12/10/90 LC50: 35.0 %  
95% fid. limits: 28.6 - 44.2 %  
comments: 60% MORTALITY IN 50% TEST CONCENTRATION.

Boiler Blwdn Unit 5

03910112 sampled: 01/08/91 LC50: 70.7 %  
95% fid. limits: 50.0 - 100.0 %  
comments: MOE Audit Sample; TH = 0 mg/L; floaters

Nanticoke TGS (continued)

03910014 sampled: 01/08/91 LC50: 67.1 %  
95% fid. limits: 13.1 - 342.7 % slope: 0.8  
comments: MOE Audit Sample; TH = 0 mg/L; floaters

Boiler Blwdn Unit 6

03910017 sampled: 01/08/91 LC50: 0.0 - 0.0 %  
95% fid. limits: 50.0 - 100.0 %  
comments: MOE Audit Sample; TH = 0 mg/L; Range 50-100

06910112 sampled: 01/28/91 LC50: 84.4 %  
95% fid. limits: 65.0 - 100.0 %  
comments: 90% MORTALITY IN 100%.

Boiler Blwdn Unit 7

06910773 sampled: 04/22/91 LC50: 61.1 %  
95% fid. limits: 55.9 - 66.6 %  
comments: 80% MORTALITY IN 65%.

Boiler Blwdn Unit 8

06910336 sampled: 02/25/91 LC50: 34.4 %  
95% fid. limits: 28.9 - 39.8 %  
comments: 40% MORTALITY IN 30%.

06910994 sampled: 05/27/91 LC50: 60.2 %  
95% fid. limits: 51.5 - 71.2 %  
comments: 40% MORTALITY IN 50%.

Coal Pile Runoff NE Sump

Coal Pile Runoff NW Sump

EC Boiler Acid Wash Unit1

EC Boiler Acid Wash Unit2

EC Boiler Acid Wash Unit3

EC Boiler Acid Wash Unit4

EC Boiler Acid Wash Unit5

EC Boiler Acid Wash Unit6

Nanticoke TGS (continued)

EC Boiler Acid Wash Unit 7

EC Boiler Acid Wash Unit 8

EC Ext Boiler Wash Unit 1

EC Ext Boiler Wash Unit 2

EC Ext Boiler Wash Unit 3

EC Ext Boiler Wash Unit 4

EC Ext Boiler Wash Unit 5

EC Ext Boiler Wash Unit 6

EC Ext Boiler Wash Unit 7

EC Ext Boiler Wash Unit 8

EC Preheater Wash Unit 12

EC Preheater Wash Unit 34

EC Preheater Wash Unit 56

EC Preheater Wash Unit 78

Emergency Overflow

EO Hydrovac Unit 12

EO Hydrovac Unit 34

EO Hydrovac Unit 56

EO Hydrovac Unit 78

EO Ash Lagoon

EO Dust Suppression Pumps

SW-East

SW-South

Nanticoke TGS (continued)

SW-West

SW Truck Wash Station

WTP-Neut. Sump

Rain Gauge

Intake Water

06902073 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910104 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910330 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910539 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910769 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910988 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED

TRO-Unit 1

TRO-Unit 2

TRO-Unit 3

TRO-Unit 4

TRO-Unit 5

TRO-Unit 6

Nanticoke TGS (continued)

TRO-Unit 7

TRO-Unit 8





COMPANY: R.L.Hearn TGS (Mothballed), Toronto  
(1840602)  
SECTOR: Electric Power Generation  
REGION: Central

#### SUMMARY

Rainbow trout acute lethality toxicity test data for two effluent and two Intake Water samples collected between December 1990 and May 1991 were submitted by the mothballed R.L. Hearn Thermal Generating Station of Toronto.

Both Intake Water (600) samples and CW-Outfall (300) samples were non-lethal.

---

SW-Sumphouse 1

BE-Sumphouse 3

CW-Outfall

06910020 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910631 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Rain Gauge

#### INTAKE

06910018 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910633 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED



COMPANY: R.L.Hearn TGS (Mothballed), Toronto  
(1840602)  
SECTOR: Electric Power Generation  
REGION: Central

#### SUMMARY

Daphnia magna acute lethality toxicity test data for two effluent samples and two Intake water samples collected between December 1990 and May 1991 were submitted by the mothballed R.L Hearn Thermal Generating Station of Toronto.

The two Intake Water (600) samples and both samples from the CW-Outfall (300) were not acutely lethal to Daphnia.

---

SW-Sumphouse 1

BE-Sumphouse 3

CW-Outfall

06910021 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910632 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Rain Gauge

#### INTAKE

06910019 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910634 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS



COMPANY: Thunder Bay GS, Thunder Bay  
(1841907)  
SECTOR: Electric Power Generation  
REGION: Northwest

#### SUMMARY

Rainbow trout acute lethality toxicity test data for 26 effluent and six Intake Water samples collected between December 1990 and May 1991 were submitted by Thunder Bay Generating Station of Thunder Bay.

The six Intake Water (1700) samples were non-lethal, as were the six samples from the Oily Water Separator (1100) and Ash Transport System (200), and both samples from the CCW Outfall (100). Two Ministry audit samples from each of the Oily Water Separator and Ash Transport System were also non-lethal.

Three of six samples collected from Boiler Blowdown Unit 2 (500) and Unit 3 (600) were acutely lethal to trout. 96 h LC50s ranged between 82.6 and 88.4% effluent. Three samples had LC50s > 100%. A Ministry audit sample collected from Unit 2 was non-lethal to trout.

Three of six samples from the WTP Neutral Sump (1500) were non-lethal, and three samples were toxic to trout. 96 h LC50s for the three samples were 2.6, 8.4 and 13.6% effluent. Ministry audit samples collected in February and May were non-lethal.

---

#### CCW Outfall

04910797 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04912380 sampled: 05/13/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

#### Ash Transport System

04905518 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

04910179 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

Thunder Bay GS (continued)

04910798 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

03910132 sampled: 02/20/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 60 mg/L; MOE Audit

04911268 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04911839 sampled: 04/15/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04912381 sampled: 05/13/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

03910328 sampled: 05/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MOE Audit; Effluent Hardness = 88 mg/l

Boiler Blowdown Unit 2

04905519 sampled: 12/10/90 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

04911840 sampled: 04/15/91 LC50: 85.1 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

04912382 sampled: 05/13/91 LC50: 82.6 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

03910327 sampled: 05/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MOE Audit; Effluent Hardness = 6mg/l

Boiler Blwdn-Unit 3

04910180 sampled: 01/14/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 1 dead @ 100%

04910799 sampled: 02/11/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

Thunder Bay GS (continued)

04911269 sampled: 03/11/91 LC50: 88.4 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

Coal Pile Runoff

EC Boiler Wash/Clean

EC Air Preheater Wash

EO Surge Tank Overflow

Oily Water Seperator

04905520 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

04910181 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

04910800 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

03910130 sampled: 02/20/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 40 mg/L; MOE Audit

04911270 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04911841 sampled: 04/15/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04912383 sampled: 05/13/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

03910326 sampled: 05/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MOE Audit; Effluent Hardness = 70 mg/l

Thunder Bay GS (continued)

SW Combustion Turbine

SW Roadway Drains

WTP Neut. Sump

04905521	sampled: 12/10/90	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:	non-lethal	
04910182	sampled: 01/14/91	LC50: 2.6 %
95% fid. limits:	2.4 -	2.8 %
comments:	A-test <10%	
04910801	sampled: 02/11/91	LC50: 13.6 %
95% fid. limits:	0.0 -	0.0 %
comments:		
03910131	sampled: 02/20/91	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:	Effluent Hardness = 40 mg/L; MOE Audit	
04911271	sampled: 03/11/91	LC50: .8.4 %
95% fid. limits:	0.0 -	0.0 %
comments:	A-test (10-100%) <10%	
04911842	sampled: 04/15/91	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:		
04912384	sampled: 05/13/91	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:		
03910329	sampled: 05/28/91	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:	MOE Audit; Effluent Hardness = 60 mg/l	

Rain Gauge

Intake Water

04905522	sampled: 12/10/90	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:	non-lethal	
04910183	sampled: 01/14/91	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:	non-lethal	



Thunder Bay GS (continued)

04910802 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04911272 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04911843 sampled: 04/15/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04912385 sampled: 05/13/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

Unit 2A Condensor CW

Unit 2B Condensor CW

Unit 3A Condensor CW

Unit 3B Condensor CW



COMPANY: Thunder Bay GS, Thunder Bay  
(1841907)  
SECTOR: Electric Power Generation  
REGION: Northwest

#### SUMMARY

Daphnia magna acute lethality toxicity test data for 26 effluent and six intake Water samples collected between December 1990 and May 1991 were submitted by Thunder Bay Generating Station of Thunder Bay.

The six Intake Water (1700) samples were non-lethal, as were the six samples from the Oily Water Separator (1100), and both samples from the CCW Outfall (100). Two Ministry audit samples from the Oily Water Separator were also non-lethal.

Five of six samples from the Ash Transport System (200) were not acutely lethal to Daphnia, and one sample had an LC50 > 100%. Both Ministry audits of this outfall were also non-lethal.

The six samples collected from Boiler Blowdown Unit 2 (500) and Unit 3 (600) were acutely lethal to Daphnia. 48 h LC50s ranged between 42.2 and 83.1% effluent. A Ministry audit sample collected from Unit 2 was also toxic to Daphnia and had an LC50 = 82.3%.

Two of six samples from the WTP Neutral Sump (1500) were non-lethal and one sample had a 48 h LC50 > 100%. Three samples were toxic to Daphnia, with LC50s between 1.7 and 6.8% effluent. A Ministry audit sample collected in February was non-lethal and the sample collected in May was toxic, with an LC50 = 70.7%.

---

#### CCW Outfall

04910797 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04912380 sampled: 05/13/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

#### Ash Transport System

04905518 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

Thunder Bay GS (continued)

04910179 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

04910798 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

03910132 sampled: 02/20/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 60 mg/L; MOE Audit

04911268 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04911839 sampled: 04/15/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

04912381 sampled: 05/13/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

03910328 sampled: 05/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 88 mg/L; MOE Audit

Boiler Blowdown Unit 2

04905519 sampled: 12/10/90 LC50: 62.7 %  
95% fid. limits: 52.8 - 74.4 %  
comments:

04911840 sampled: 04/15/91 LC50: 51.3 %  
95% fid. limits: 44.1 - 59.6 %  
comments:

04912382 sampled: 05/13/91 LC50: 69.4 %  
95% fid. limits: 59.6 - 80.6 %  
comments:

03910327 sampled: 05/28/91 LC50: 82.3 %  
95% fid. limits: 68.1 - 99.5 % slope: 8.0  
comments: Effluent Hardness = 6 mg/L; MOE Audit

Thunder Bay GS (continued)

Boiler Blwdn-Unit 3

04910180 sampled: 01/14/91 LC50: 80.6 %  
95% fid. limits: 66.4 - 97.8 %  
comments:  
04910799 sampled: 02/11/91 LC50: 42.2 %  
95% fid. limits: 33.8 - 52.5 %  
comments:  
04911269 sampled: 03/11/91 LC50: 83.1 %  
95% fid. limits: 73.3 - 94.2 %  
comments:

Coal Pile Runoff

EC Boiler Wash/Clean

EC Air Preheater Wash

EO Surge Tank Overflow

Oily Water Separator

04905520 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal  
04910181 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal  
04910800 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:  
03910130 sampled: 02/20/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 40 mg/L; MOE Audit  
04911270 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:  
04911841 sampled: 04/15/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:  
04912383 sampled: 05/13/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

Thunder Bay GS (continued)

03910326 sampled: 05/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 70 mg/L; MOE Audit

SW Combustion Turbine

SW Roadway Drains

WTP Neut. Sump

04905521 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

04910182 sampled: 01/14/91 LC50: 1.7 %  
95% fid. limits: 1.3 - 2.1 %  
comments: A-test <10%

04910801 sampled: 02/11/91 LC50: 5.3 %  
95% fid. limits: 4.3 - 6.4 %  
comments: A-test <10%

03910131 sampled: 02/20/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 40 mg/L; MOE Audit

04911271 sampled: 03/11/91 LC50: 6.8 %  
95% fid. limits: 5.8 - 8.0 %  
comments: A-test (10-100%) <10%

04911842 sampled: 04/15/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04912384 sampled: 05/13/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

03910329 sampled: 05/28/91 LC50: 70.7 %  
95% fid. limits: 50.0 - 100.0 %  
comments: Effluent Hardness = 60 mg/L; MOE Audit

Rain Gauge

Intake Water

04905522 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

Thunder Bay GS (continued)

04910183 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: non-lethal

04910802 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04911272 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04911843 sampled: 04/15/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

04912385 sampled: 05/13/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

Unit 2A Condensor CW

Unit 2B Condensor CW

Unit 3A Condensor CW

Unit 3B Condensor CW





COMPANY: Bruce NGS - A, Tiverton  
(1844208)  
SECTOR: Electric Power Generation  
REGION: Southwest

#### SUMMARY

Rainbow trout acute lethality toxicity test data for twenty-one effluent and six Intake Water samples collected between December 1990 and May 1991 were submitted by Bruce Nuclear Generating Station - A of Tiverton.

The six Intake Water (1500) samples were not acutely lethal to trout. Similarly, the two samples from the CCW-Outfall (1400) were non-lethal.

Six of seven samples from the \*\*\* RLWM Tanks (100) were non-lethal. The sample collected in December was lethal to trout with a 96 h LC50 = 41.2% effluent.

One of five samples from Boiler Blowdown U3 (800) was non-lethal and three samples had LC50s > 100% effluent. One sample was toxic to trout with a 96 h LC50 = 96.5%. The one sample collected from Boiler Blowdown U1 (200) was lethal to trout and had an LC50 = 92% effluent.

All six samples collected from the WTP Neutral Sump were toxic to trout with 96 h LC50s ranging between 3.3 and 24.5% effluent.

---

#### \*\*\* RLWM Tanks

14901103 sampled: 12/10/90 LC50: 41.2 %  
95% fid. limits: 30.4 - 51.5 % slope: 4.4  
comments:

14911018 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911037 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911050 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911065 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

Bruce NGS - A (continued)

14911077 sampled: 05/20/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911085 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

BE-Rh Drain-U1

BE-Rh Drain-U2

BE-Rh Drain-U3

BE-Rh Drain-U4

Boiler Blwdn-U1

14911083 sampled: 05/27/91 LC50: 92.0 %  
95% fid. limits: 75.4 - 112.0 %  
comments: alpha = 20

Boiler Blwdn-U2

Boiler Blwdn-U3

14901099 sampled: 12/10/90 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911013 sampled: 01/28/91 LC50: 96.5 %  
95% fid. limits: 90.4 - 161.0 % slope: 28.5  
comments: 6 fish in 100%. deaths 24-72hrs/2,96hr/4

14911038 sampled: 02/25/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911049 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911062 sampled: 04/22/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

Bruce NGS - A (continued)

Boiler Blwdn-U4

CCW-Outfall

06910353 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06911015 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Oily Water Separator

SW-Manhole 35

WTP Neut. Sump

06902104 sampled: 12/10/90 LC50: 3.3 %  
95% fid. limits: 2.7 - 4.0 %  
comments: MULTIPLY COND. IN 100% AT 0 & 24 HRS. BY 10.

06910143 sampled: 01/28/91 LC50: 24.5 %  
95% fid. limits: 20.0 - 30.0 %  
comments: COMPLETE MORTALITY IN 30%.

06910351 sampled: 02/25/91 LC50: 14.1 %  
95% fid. limits: 10.0 - 20.0 %  
comments: COMPLETE MORTALITY IN 20%.

06910564 sampled: 03/25/91 LC50: 3.9 %  
95% fid. limits: 3.0 - 5.0 %  
comments: COND IN 100% AT 0 & 24 HRS TO BE MULT. BY 10.

06910786 sampled: 04/22/91 LC50: 3.6 %  
95% fid. limits: 3.1 - 4.2 %  
comments: COND. IN 100% AT 0 & 24 HRS TO BE MULT BY 10

06911013 sampled: 05/27/91 LC50: 3.9 %  
95% fid. limits: 3.0 - 5.0 %  
comments: CONDUCTIVITY IN 100% TO BE MULTIPLIED BY 10

Intake Water

06902102 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910141 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Bruce NGS - A (continued)

06910349 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910562 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910788 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06911011 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Rain Gauge

EC-Boiler Layup Unit 1

EC-Boiler Layup Unit 2

EC-Boiler Layup Unit 3

EC-Boiler Layup Unit 4

COMPANY: Bruce NGS - A, Tiverton  
(1844208)  
SECTOR: Electric Power Generation  
REGION: Southwest

#### SUMMARY

Daphnia magna acute lethality toxicity test data for 21 effluent samples and 6 Intake Water samples collected between December 1990 and May 1991 were submitted by Bruce Nuclear Generating Station A of Tiverton.

The six Intake Water (1500) and two samples from CCW-Outfall (1000) were not acutely lethal to Daphnia.

Three of seven samples from the Radioactive Liquid Waste Management Tanks (100) were not acutely lethal to Daphnia, and two samples had LC50s > 100% effluent. Two samples were lethal, and had 48 h LC50s of 35.3 and 93.8%.

The one sample from Boiler Blowdown U1 (600), and two of five samples from BB U3 (800) were acutely lethal to Daphnia with 48 h LC50s between 83.0 and 89.4% effluent. Two samples were non-lethal and one sample had an LC50 > 100%.

The six samples collected from the Waste Treatment Plant Neutralization Sump were consistently lethal to Daphnia. 48 h LC50s were between 0.2 and 14.1% effluent.

---

#### \*\*\* RLWM Tanks

14902103 sampled: 12/10/90 LC50: 35.3 %  
95% fid. limits: 27.5 - 44.1 %  
comments: 50%,48hrs:10 immobile, 24%, 48hrs:3 immobile

14912018 sampled: 01/28/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 48 hrs, 100%: 3 immobile

14912037 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14912050 sampled: 03/25/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 48hrs:100%,8im;80%,7im;40%,6im;20%,8im;10%,8i

14912065 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

Bruce NGS - A (continued)

14912077 sampled: 05/20/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14912085 sampled: 05/27/91 LC50: 93.8 %  
95% fid. limits: 69.8 - 126.1 %  
comments: alpha=30. 48hrs immobilities:100%/8, 80%/2

BE-Rh Drain-U1

BE-Rh Drain-U2

BE-Rh Drain-U3

BE-Rh Drain-U4

Boiler Blwdn-U1

14912083 sampled: 05/27/91 LC50: 89.4 %  
95% fid. limits: 80.0 - 100.0 %  
comments:

Boiler Blwdn-U2

Boiler Blwdn-U3

14902099 sampled: 12/10/90 LC50: 83.0 %  
95% fid. limits: 81.1 - 84.8 %  
comments: 48 hrs: 10 immobile in 90%

14912013 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14912038 sampled: 02/25/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 48 hr immobilites: 100%/6, 50%/1

14912049 sampled: 03/25/91 LC50: 89.4 %  
95% fid. limits: 80.0 - 100.0 %  
comments:

14912062 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

Bruce NGS - A (continued)

Boiler Blwdn-U4

CCW-Outfall

06910354 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06911016 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Oily Water Separator

SW-Manhole 35

WTP Neut. Sump

06902105 sampled: 12/10/90 LC50: 3.5 %  
95% fid. limits: 2.5 - 5.0 %  
comments: COND. IN 100% AT 0 & 48 HRS TO BE MULT. BY 10

06910144 sampled: 01/28/91 LC50: 14.1 %  
95% fid. limits: 10.0 - 20.0 %  
comments: COMPLETE MORTALITY IN 20%.

06910352 sampled: 02/25/91 LC50: 14.1 %  
95% fid. limits: 10.0 - 20.0 %  
comments: COMPLETE MORTALITY IN 20%.

06910565 sampled: 03/25/91 LC50: 2.2 %  
95% fid. limits: 1.7 - 2.7 %  
comments: 70% MORTALITY IN 3%.

06910787 sampled: 04/22/91 LC50: 0.2 %  
95% fid. limits: 0.1 - 0.3 %  
comments: CONDUCTIVITY IN 100% >20,000.

06911014 sampled: 05/27/91 LC50: 1.7 %  
95% fid. limits: 1.0 - 3.0 %  
comments: CONDUCTIVITY IN 100% & 65% TO BE MULT. BY 10

Intake Water

06902103 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910142 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Bruce NGS - A (continued)

06910350 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910563 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910789 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06911012 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Rain Gauge

EC-Boiler Layup Unit 1

EC-Boiler Layup Unit 2

EC-Boiler Layup Unit 3

EC-Boiler Layup Unit 4



COMPANY: Bruce NGS - B, Tiverton  
(1844307)  
SECTOR: Electric Power Generation  
REGION: Southwest

#### SUMMARY

Rainbow trout acute lethality toxicity test data for twentyeffluent and six Intake Water samples collected between December 1990 and May 1991 were submitted by Bruce Nuclear Generating Station - B of Tiverton.

All six Intake Water (2100) samples were not acutely lethal to trout, as were both samples from the CCW-Outfall (1400).

Three of six samples from the \*\*\* RLWM Tanks (100) were non-lethal and the remaining three samples had 96 h LC50s > 100% effluent.

One of two samples from each of Boiler Blowdowns U5 (1000) and U6 (1100) were non-lethal, as were both samples from U8 (1300). The remaining samples had LC50s > 100%.

Four of six samples from the WTP-Neutral Sump (2000) were not acutely lethal to trout, one sample had an LC50 > 100% effluent and one sample had a 96 h LC50 = 84.4%.

---

#### \*\*\* RLWM Tanks

14911005 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911017 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911039 sampled: 02/25/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: pass/fail test lethal

14911048 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911066 sampled: 04/22/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911084 sampled: 05/27/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

Bruce NGS - B (continued)

BE-Inac Dr-U5

BE-Inac Dr-U6

BE-Inac Dr-U7

BE-Inac Dr-U8

BE-Rh Dr-U5

BE-Rh Dr-U6

BE-Rh Dr-U7

BE-Rh Dr-U8

Boiler Blwdn-U5

14911036 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911080 sampled: 05/27/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

Boiler Blwdn-U6

14911047 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911063 sampled: 04/22/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

Boiler Blwdn-U7

Boiler Blwdn-U8

14901100 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911015 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

Bruce NGS - B (continued)

CCW-Outfall

06910359 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06911023 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Oily Water Separator

SW-Manhole 1

SW-Manhole 28

SW-Manhole 8

WTP-Neut. Sump

06902108 sampled: 12/10/90 LC50: 84.4 %  
95% fid. limits: 65.0 - 100.0 %  
comments: 90% MORTALITY IN 100% TEST CONCENTRATION.

06910139 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910357 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910560 sampled: 03/25/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 30,50,65 & 100%.

06910790 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06911019 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Intake Water

06902106 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Bruce NGS - B (continued)

06910137 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910355 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910558 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910792 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06911017 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Rain Gauge

EC Boiler Layup U5

EC Boiler Layup U6

EC Boiler Layup U7

EC Boiler Layup U8

COMPANY: Bruce NGS - B, Tiverton  
(1844307)  
SECTOR: Electric Power Generation  
REGION: Southwest

#### SUMMARY

Daphnia magna acute lethality toxicity test data for 20 effluent samples and six Intake Water samples collected between December 1990 and May 1991 were submitted by Bruce Nuclear Generating Station B of Tiverton.

The six Intake Water (2100) samples were not acutely lethal to Daphnia, as were two samples from the CCW-Outfall (1400) and six samples from Boiler Blowdowns U5 (1000), U6 (1100), and U8 (1300).

Two of six samples from the Radioactive Liquid Waste Management Tanks (100) were non-lethal, and three samples had LC50s > 100%. One sample collected in December had a 48 h LC50 = 41.4% effluent.

Three of six samples from the Waste Treatment Plant Neutralization Sump (2000) were not acutely lethal to Daphnia and two samples had LC50s > 100%. A sample collected in December was lethal to Daphnia, with 48 h LC50 of 80.6% effluent.

---

#### \*\*\* RLWM Tanks

14912005 sampled: 01/14/91 LC50: 41.4 %  
95% fid. limits: 32.6 - 53.8 %  
comments: 48 hrs: Immobilities. See attached note

14912017 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14912039 sampled: 02/25/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 48 hr: 8 immobile in 100%

14912048 sampled: 03/25/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

14912066 sampled: 04/22/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

14912084 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

Bruce NGS - B (continued)

BE-Inac Dr-U5

BE-Inac Dr-U6

BE-Inac Dr-U7

BE-Inac Dr-U8

BE-Rh Dr-U5

BE-Rh Dr-U6

BE-Rh Dr-U7

BE-Rh Dr-U8

Boiler Blwdn-U5

14912036 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14912080 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: 48hr: 1 immobile in 10%

Boiler Blwdn-U6

14912047 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14912063 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

Boiler Blwdn-U7

Boiler Blwdn-U8

14902100 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14912015 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: 48 hrs, 45%: 1 immobile

Bruce NGS - B (continued)

CCW-Outfall

06910360 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06911024 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Oily Water Separator

SW-Manhole 1

SW-Manhole 28

SW-Manhole 8

WTP-Neut. Sump

06902109 sampled: 12/10/90 LC50: 80.6 %  
95% fid. limits: 65.0 - 100.0 %  
comments: COMPLETE MORTALITY IN 100% CONCENTRATION.

06910140 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910358 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910561 sampled: 03/25/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 30% MORTALITY IN 100%.

06910791 sampled: 04/22/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 30% MORTALITY IN 100%.

06911020 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED

Intake Water

06902107 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Bruce NGS - B (continued)

06910138 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910356 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910559 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910793 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06911018 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Rain Gauge

EC Boiler Layup U5

EC Boiler Layup U6

EC Boiler Layup U7

EC Boiler Layup U8



COMPANY: Darlington NGS, Bowmanville  
(49001506)  
SECTOR: Electric Power Generation  
REGION: Central

#### SUMMARY

Rainbow trout acute lethality toxicity test data for twenty-three effluent and six Intake Water samples collected between December 1990 and May 1991 were submitted by Darlington Nuclear Generating Station of Bowmanville.

Five of six samples of Intake Water (2400) were not acutely lethal to trout. The sample collected in March was very toxic, with a 96 h LC50 = 0.2% effluent.

The six samples collected from the \*\*\* RLWM Tanks (100) and both samples from the CCW-Outfall (1800) were non-lethal.

The one sample collected from Boiler Blowdown U1 (2600) and both samples from U2 (1700) were acutely toxic to trout with 96 h LC50s between 88.3 and 94.9% effluent.

One of six samples from the Oily Water Separator (1900) was non-lethal and two samples had LC50s > 100%. The remaining three samples were lethal to trout with 96 h LC50s between 7.1 and 75.2% effluent.

One of six samples from the WTP Neutral Sump (2200) was non-lethal. The remaining five samples were toxic to trout with LC50s between 16.7 and 38.7% effluent.

---

#### \*\*\* RLWM Tanks

14901096 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911001 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911019 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911043 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911056 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

Darlington NGS (continued)

14911070 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

BE-CSA Pump

BE-ESW Pumphouse

BE-HWMB

BE-U1 Pumphouse

BE-U2 Pumphouse

BE-U1 Sump A

BE-U1 Sump B

BE-U1 Sump C

BE-U1 Sump D

BE-U1 Sump E

BE-U2 Sump 1

BE-U2 Sump 2

BE-U2 Sump 3

BE-U2 Sump 4

BE-WTP

Boiler Blwdn U2

14901097 sampled: 12/03/90 LC50: 94.9 %  
95% fid. limits: 90.0 - 100.0 %  
comments:

14911068 sampled: 05/06/91 LC50: 88.3 %  
95% fid. limits: 82.8 - 94.0 %  
comments: alpha = 8

CCW-Outfall

06910231 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Darlington NGS (continued)

06910845 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Oily Water Separator

06902036 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910046 sampled: 01/14/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 100% CONCENTRATION.

06910213 sampled: 02/11/91 LC50: 7.1 %  
95% fid. limits: 5.0 - 10.0 %  
comments: COMPLETE MORTALITY IN 10%.

06910475 sampled: 03/11/91 LC50: 38.7 %  
95% fid. limits: 30.0 - 50.0 %  
comments: 100% MORTALITY IN THE 50% CONCENTRATION

06910663 sampled: 04/08/91 LC50: 75.2 %  
95% fid. limits: 68.9 - 82.1 %  
comments: 20% MORTALITY IN 65%.

06910847 sampled: 05/06/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 20% MORTALITY IN 100%.

SW Manhole 214

SW Manhole 814

WTP-Neutral Sump

06902048 sampled: 12/04/90 LC50: 16.7 %  
95% fid. limits: 14.2 - 19.6 %  
comments: 70% MORTALITY IN 20% TEST CONCENTRATION.

06910044 sampled: 01/14/91 LC50: 23.2 %  
95% fid. limits: 20.9 - 25.7 %  
comments: 10% MORTALITY IN 20% TEST CONCENTRATION.

06910215 sampled: 02/11/91 LC50: 24.5 %  
95% fid. limits: 20.0 - 30.0 %  
comments: COMPLETE MORTALITY IN 30%.

06910471 sampled: 03/11/91 LC50: 38.7 %  
95% fid. limits: 30.0 - 50.0 %  
comments: 100% MORTALITY IN THE 50% CONCENTRATION

Darlington NGS (continued)

06910661 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910903 sampled: 05/14/91 LC50: 24.5 %  
95% fid. limits: 20.0 - 30.0 %  
comments: COMPLETE MORTALITY IN 30%.

Rain Gauge

Intake Water

06902034 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910042 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910209 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910473 sampled: 03/11/91 LC50: 0.2 %  
95% fid. limits: 0.1 - 0.3 %  
comments: CONDUCTIVITY METERS CHANGED DURING TESTING.

06910659 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910905 sampled: 05/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

BE-U2 Sump 5

Boiler Blwdn Unit 1

14911020 sampled: 02/11/91 LC50: 88.3 %  
95% fid. limits: 86.0 - 90.6 %  
comments:

EC HTG Steam Cond

Darlington NGS (continued)

Sewage Treatment Plant



COMPANY: Darlington NGS, Bowmanville  
(49001506)  
SECTOR: Electric Power Generation  
REGION: Central

#### SUMMARY

Daphnia magna acute lethality toxicity test data for 23 effluent samples and 6 Intake Water samples collected between December 1990 and May 1991 were submitted by Darlington Nuclear Generating Station of Bowmanville.

Five Intake Water (2400) samples were not acutely lethal to Daphnia, and one sample had a 48 h LC50 = 0.2% effluent.

Two samples from the CCW-Outfall (1800) and one sample from Boiler Blowdown U1 (2600) were not acutely lethal to Daphnia. One of two samples from Boiler Blowdown U2 (1700) was non-lethal and one sample had an 48 h LC50 = 51.0% effluent.

Four of six samples from the Radioactive Liquid Waste Management Tanks (100) were non-lethal and two samples had LC50s > 100%.

Two of six samples from the Oily Water Separator (1900) were non-lethal and four samples were lethal with LC50s between 14.1 and 94.7% effluent.

One of six samples from the Waste Treatment Plant Neutralization Sump (2200) was non-lethal and the remaining five samples were toxic with LC50s between 14.1 and 24.5% effluent.

---

#### \*\*\* RLWM Tanks

14902096 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: 48hrs: 10 immobile but hearts beating

14912001 sampled: 01/14/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 48 hrs: Immobilities. See note

14912019 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14912043 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

Darlington NGS (continued)

14912056 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14912070 sampled: 05/06/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

BE-CSA Pump

BE-ESW Pumphouse

BE-HWMB

BE-U1 Pumphouse

BE-U2 Pumphouse

BE-U1 Sump A

BE-U1 Sump B

BE-U1 Sump C

BE-U1 Sump D

BE-U1 Sump E

BE-U2 Sump 1

BE-U2 Sump 2

BE-U2 Sump 3

BE-U2 Sump 4

BE-WTP

Boiler Blwdn U2

14902097 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14912068 sampled: 05/06/91 LC50: 51.0 %  
95% fid. limits: 39.9 - 65.1 %  
comments:



Darlington NGS (continued)

CCW-Outfall

06910232 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910846 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Oily Water Separator

06902037 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910047 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910214 sampled: 02/11/91 LC50: 14.1 %  
95% fid. limits: 10.0 - 20.0 %  
comments: COMPLETE MORTALITY IN 20% CONCENTRATION.

06910476 sampled: 03/11/91 LC50: 65.2 %  
95% fid. limits: 53.5 - 77.3 %  
comments: PARTIAL MORTALITY IN 50, 65, AND 100% CONC.

06910664 sampled: 04/08/91 LC50: 90.6 %  
95% fid. limits: 65.0 - 99.9 %  
comments: 70% MORTALITY IN 100%.

06910848 sampled: 05/06/91 LC50: 94.7 %  
95% fid. limits: 65.0 - 99.9 %  
comments: 60% MORTALITY IN 100%.

SW Manhole 214

SW Manhole 814

WTP-Neutral Sump

06902049 sampled: 12/04/90 LC50: 14.1 %  
95% fid. limits: 10.0 - 20.0 %  
comments: COMPLETE MORTALITY IN 20% TEST CONCENTRATION.

06910045 sampled: 01/14/91 LC50: 24.5 %  
95% fid. limits: 20.0 - 30.0 %  
comments: COMPLETE MORTALITY IN 30% TEST CONCENTRATION

Darlington NGS (continued)

06910216 sampled: 02/11/91 LC50: 24.5 %  
95% fid. limits: 20.0 - 30.0 %  
comments: COMPLETE MORTALITY IN 30% CONCENTRATION.

06910472 sampled: 03/11/91 LC50: 21.3 %  
95% fid. limits: 16.1 - 26.7 %  
comments: PARTIAL MORTALITY IN THE 20% AND 30% CONC.

06910662 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910904 sampled: 05/14/91 LC50: 24.5 %  
95% fid. limits: 20.0 - 30.0 %  
comments: COMPLETE MORTALITY IN 30%.

Rain Gauge

Intake Water

06902035 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910043 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910210 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910474 sampled: 03/11/91 LC50: 0.2 %  
95% fid. limits: 0.1 - 0.2 %  
comments: 80% MORTALITY IN 0.25% CONCENTRATION.

06910660 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910906 sampled: 05/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

BE-U2 Sump 5

Darlington NGS (continued)

Boiler Blwdn Unit 1

14912020 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

EC HTG Steam Cond

Sewage Treatment Plant



COMPANY: Pickering NGS A & B, Pickering  
(1840206)  
SECTOR: Electric Power Generation  
REGION: Central

#### SUMMARY

Rainbow trout acute lethality toxicity test data for fifty-five effluent and six Intake Water samples collected between December 1990 and May 1991 were submitted by Pickering Nuclear Generating Stations A&B of Pickering.

The six Intake Water (3400) samples were not acutely lethal to trout. Similarly, the two samples from each of CCW-U 3a (1900), CW-AIFB (2200), CW-Sulzer A (2500), and CW-UPP (2600) were non-lethal.

One of two samples from each of CCW-U 4a (2000), CCW-U 1 & 2 - a (2100), CW-RBSW-NGS-A (2300), and CW-RBSW-NGS-B (2400) were not acutely lethal to trout and the remaining samples had LC50s > 100% effluent.

Three of six samples from the \*\*\* RLWM Tanks A (200) were not acutely lethal to trout and two samples had LC50s > 100% effluent. The sample collected in March was lethal to trout with a 96 h LC50 = 42.5% effluent.

Two of twelve sample from Boiler Blowdown Units 2 (1200), 4 (1400), 5 (1500), 6 (1600), 7 (1700) and 8 (1800) had LC50s > 100%. The remaining ten samples were acutely lethal to trout with 96 h LC50s between 76.4 and 93.8% effluent.

Five of six samples from the Oily Water Separator (2700) were non-lethal and one sample had an LC50 > 100%. A Ministry audit sample collected in March was non-lethal to trout. One of four samples from Oily Water Separator A (3600) was non-lethal and three samples had LC50s > 100%.

The six samples collected from the WTP Neutral Sump (3100) were not acutely lethal to trout. A Ministry audit sample collected in March had an LC50 > 100% effluent.

One sample of Equipment Cleaning Effluent (3800) was toxic to trout with a 96 h LC50 = 80.6% effluent.

Pickering NGS A & B (continued)

\*\*\* RLWM Tanks A

14901104 sampled: 12/17/90 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911002 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911028 sampled: 02/11/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911042 sampled: 03/11/91 LC50: 42.5 %  
95% fid. limits: 35.2 - 51.2 %  
comments:

14911057 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911073 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

\*\*\* RLWM Tanks B

BE-U1

BE-U2

BE-U3

BE-U4

BE-U5

BE-U6

BE-U7

Boiler Blwdn-U1

Boiler Blwdn-U2

14901094 sampled: 12/03/90 LC50: 89.5 %  
95% fid. limits: 84.5 - 94.8 %  
comments:

Pickering NGS A & B (continued)

14911055 sampled: 04/08/91 LC50: 89.4 %  
95% fid. limits: 80.0 - 100.0 %  
comments:

Boiler Blwdn-U3

Boiler Blwdn-U4

14911004 sampled: 01/14/91 LC50: 89.4 %  
95% fid. limits: 80.0 - 100.0 %  
comments:

14911027 sampled: 02/11/91 LC50: 89.4 %  
95% fid. limits: 80.0 - 100.0 %  
comments:

14911040 sampled: 03/11/91 LC50: 93.8 %  
95% fid. limits: 69.8 - 126.1 %  
comments: Alpha = 30

14911072 sampled: 05/06/91 LC50: 93.8 %  
95% fid. limits: 69.8 - 126.1 %  
comments: alpha = 30

Boiler Blwdn-U5

14911026 sampled: 02/11/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

Boiler Blwdn-U6

14911041 sampled: 03/11/91 LC50: 76.4 %  
95% fid. limits: 68.3 - 84.5 % slope: 14.9  
comments:

Boiler Blwdn-U7

14901095 sampled: 12/03/90 LC50: 88.4 %  
95% fid. limits: 87.4 - 90.4 %  
comments:

14911054 sampled: 04/08/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

Pickering NGS A & B (continued)

Boiler Blwdn-U8

14911003 sampled: 01/14/91 LC50: 80.6 %  
95% fid. limits: 65.0 - 100.0 %  
comments:

14911067 sampled: 05/06/91 LC50: 89.4 %  
95% fid. limits: 80.0 - 100.0 %  
comments:

CCW-U 3a

06910227 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910857 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

CCW-U 4a

06910221 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910859 sampled: 05/06/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 20%.

CCW-U 1 & 2 - a

06910225 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910855 sampled: 05/06/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 50 & 65%.

CW-AIFB

06910271 sampled: 02/18/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910923 sampled: 05/20/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED



Pickering NGS A & B (continued)

CW-RBSW-NGS-A

06910275 sampled: 02/18/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 50%.

06910915 sampled: 05/20/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

CW-RBSW-NGS-B

06910343 sampled: 02/25/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 100%.

06910917 sampled: 05/20/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

CW-Sulzer A

06910345 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910921 sampled: 05/20/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

CW-UPP

06910273 sampled: 02/18/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910925 sampled: 05/20/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Oily Water Separator

14901098 sampled: 12/03/90 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911012 sampled: 01/21/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

Pickering NGS A & B (continued)

14911024 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

06910481 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

03910167 sampled: 03/12/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 50 mg/L; MOE Audit

06910675 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910849 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SW-CB 70

SW-Manhole 37

SW-Manhole 85

WTP-Neut. Sump

06902042 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910062 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910219 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910477 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

03910166 sampled: 03/12/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 265 mg/L; MOE Audit

06910673 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Pickering NGS A & B (continued)

06910861 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

CCW-NGS-B

06910223 sampled: 02/11/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 50%.

06910851 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Sulzer B

06910347 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910919 sampled: 05/20/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Intake Water

06902038 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910060 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910217 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910479 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910671 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910853 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Pickering NGS A & B (continued)

Rain Gauge

Oily Water Separator A

06902040 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

14911009 sampled: 01/14/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911025 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911044 sampled: 03/11/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

RLWM Tanks B

Equip. Clean. Effluent

06910151 sampled: 01/28/91 LC50: 80.6 %  
95% fid. limits: 65.0 - 100.0 %  
comments: COMPLETE MORTALITY IN 100%.

COMPANY: Pickering NGS A & B, Pickering  
(1840206)  
SECTOR: Electric Power Generation  
REGION: Central

#### SUMMARY

Daphnia magna acute lethality toxicity test data for 54 effluent and six Intake Water samples collected between December 1990 and May 1991 were submitted by Pickering Nuclear generating Station A & B of Pickering.

The six Intake Water (3400) samples were not acutely lethal to Daphnia. Similarly, the two samples collected from each of CCW-U 3a (1900), CCW-U 4a (2000), CCW-U 1&2 - a (2100), CW-AIFB (2200), CW-RBSW-NGS-A (2300), CW-Sulzer A (2500), CW-UPP (2600), CW-NGS-B (3200), and Sulzer B (3300) were non-lethal.

One of two samples from CW-RBSW-NGS-B (2400) was non-lethal and the other had an LC50 > 100%.

Six samples collected from the WTP-Neutral sump (3100) were not acutely lethal to Daphnia. A Ministry audit sample collected from this site in March was also non-lethal.

Four of six samples collected from the \*\*\* RLWM Tanks A (200) were non-lethal, and one sample had a LC50 > 100%. The sample collected in March was lethal, with a 48 h LC50 = 28.3% effluent.

The eleven Boiler Blowdown samples from units U2 (1200), U4 (1400), U5 (1500), U6 (1600), U7 (1700) and U8 (1800) were all lethal to Daphnia. 48 h LC50 values ranged between 58.8 and 94.2% effluent.

Four of six sample collected from the Oily Water Separator (2700) were non-lethal and one sample had an LC50 > 100%. The sample collected in May was lethal to Daphnia with a 48 h LC50 = 80.6%. A Ministry audit sample collected from this site in March was non-lethal. Two of four samples collected from Oily Water Separator A (3600) were non-lethal and two samples had LC50s > 100%.

One sample collected from Equipment Cleaning Effluent (3800) was toxic to Daphnia with a 48 h LC50 = 26.8%.

---

Pickering NGS A & B (continued)

BE-Unit 8

\*\*\* RLWM Tanks A

14902104 sampled: 12/17/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14912002 sampled: 01/14/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 48 hrs: Immobilities. See attached note.

14912028 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14912042 sampled: 03/11/91 LC50: 28.3 %  
95% fid. limits: 21.9 - 36.3 %  
comments: 48hrs: 14%, 1 immobile

14912057 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14912073 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

\*\*\* RLWM Tanks B

BE-U1

BE-U2

BE-U3

BE-U4

BE-U5

BE-U6

BE-U7

Boiler Blwdn-U1

Pickering NGS A & B (continued)

Boiler Blwdn-U2

14902094 sampled: 12/03/90 LC50: 94.2 %  
95% fid. limits: 93.1 - 95.4 %  
comments: 48hrs: 2 immobile but only 1 dead

14912055 sampled: 04/08/91 LC50: 58.8 %  
95% fid. limits: 54.0 - 63.8 %  
comments:

Boiler Blwdn-U3

Boiler Blwdn-U4

14912004 sampled: 01/14/91 LC50: 62.6 %  
95% fid. limits: 59.6 - 65.7 %  
comments: 48hrs: 75%, 10 immobile, 9 dead

14912027 sampled: 02/11/91 LC50: 85.2 %  
95% fid. limits: 82.4 - 88.1 %  
comments:

14912040 sampled: 03/11/91 LC50: 86.6 %  
95% fid. limits: 75.0 - 100.0 %  
comments:

14912072 sampled: 05/06/91 LC50: 89.4 %  
95% fid. limits: 80.0 - 100.0 %  
comments:

Boiler Blwdn-U5

14912026 sampled: 02/11/91 LC50: 86.6 %  
95% fid. limits: 75.0 - 100.0 %  
comments:

Boiler Blwdn-U6

14912041 sampled: 03/11/91 LC50: 75.7 %  
95% fid. limits: 66.0 - 86.8 %  
comments: 48 hrs: 75%, 8im, 25%, 2im.

Boiler Blwdn-U7

14902095 sampled: 12/03/90 LC50: 86.6 %  
95% fid. limits: 75.0 - 100.0 %  
comments:



Pickering NGS A & B (continued)

Boiler Blwdn-U8

14912003 sampled: 01/14/91 LC50: 86.6 %  
95% fid. limits: 75.0 - 100.0 %  
comments: 48 hrs, 75%: 2 immobile, 0 dead

14912067 sampled: 05/06/91 LC50: 89.4 %  
95% fid. limits: 80.0 - 100.0 %  
comments:

CCW-U 3a

06910228 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910858 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

CCW-U 4a

06910222 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910860 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

CCW-U 1 & 2 - a

06910226 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910856 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

CW-AIFB

06910272 sampled: 02/18/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910924 sampled: 05/20/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS



Pickering NGS A & B (continued)

CW-RBSW-NGS-A

06910276 sampled: 02/18/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910916 sampled: 05/20/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

CW-RBSW-NGS-B

06910344 sampled: 02/25/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 100%.

06910918 sampled: 05/20/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

CW-Sulzer A

06910346 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910922 sampled: 05/20/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

CW-UPP

06910274 sampled: 02/18/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910926 sampled: 05/20/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Oily Water Separator

14902098 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14912012 sampled: 01/21/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

Pickering NGS A & B (continued)

14912024 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

06910482 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

03910167 sampled: 03/12/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 50 mg/L; MOE Audit

06910676 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910850 sampled: 05/06/91 LC50: 80.6 %  
95% fid. limits: 65.0 - 100.0 %  
comments: COMPLETE MORTALITY IN 100%.

SW-CB 70

SW-Manhole 37

SW-Manhole 85

WTP-Neut. Sump

06902043 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910063 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910220 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910478 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

03910166 sampled: 03/12/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 265 mg/L; MOE Audit

06910674 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Pickering NGS A & B (continued)

06910862 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

CCW-NGS-B

06910224 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910852 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Sulzer B

06910348 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910920 sampled: 05/20/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Intake Water

06902039 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910061 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910218 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910480 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910672 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910854 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Pickering NGS A & B (continued)

Rain Gauge

Oily Water Separator A

06902041 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

14912009 sampled: 01/14/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

14912025 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14912044 sampled: 03/11/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

RLWM Tanks B

Equip. Clean. Effluent

06910152 sampled: 01/28/91 LC50: 26.8 %  
95% fid. limits: 23.9 - 30.1 %  
comments: 80% MORTALITY IN 30% TEST CONCENTRATION.

COMPANY: Bruce Heavy Water Plant, Tiverton  
(1844406)  
SECTOR: Electric Power Generation  
REGION: Southwest

#### SUMMARY

Rainbow trout acute lethality toxicity test data for eight effluent samples and two Intake Water samples collected between December 1990 and May 1991 were submitted by Bruce Heavy Water Plant of Tiverton.

The two samples from the CCW-Outfall (200) and six samples of Process Effluent (500) were not acutely lethal to trout.

Both samples of Intake Water (900) were non-lethal.

---

#### BE-Clarifier Bldg

##### CCW-Outfall

06910327 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06911007 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

#### EC-Carb Eq. Drain

##### Effluent Lagoon

##### Process Effluent

06902088 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910127 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910325 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910548 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Bruce Heavy Water Plant (continued)

06910784 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910995 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

EC-SWTP

SW-L.P.

SW-N.F.

Intake Water

06910323 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06911009 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Rain Gauge

COMPANY: Bruce Heavy Water Plant, Tiverton  
(1844406)  
SECTOR: Electric Power Generation  
REGION: Southwest

#### SUMMARY

Daphnia magna acute lethality toxicity test data for eight effluent samples and two Intake Water samples collected between December 1990 and May 1991 were submitted by Bruce Heavy Water Plant of Tiverton.

Two samples from the CCW-Outfall (200), and six from the Process Effluent (500) were all not acutely lethal to Daphnia.

Both Intake Water samples were non-lethal.

---

#### BE-Clarifier Bldg

##### CCW-Outfall

06910328 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06911008 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

#### EC-Carb Eq. Drain

##### Effluent Lagoon

##### Process Effluent

06902089 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910128 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910326 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910549 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Bruce Heavy Water Plant (continued)

06910785 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910996 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

EC-SWTP

SW-L.P.

SW-N.F.

Intake Water

06910324 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06911010 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Rain Gauge



COMPANY: Bruce Nuc Power Dev't Services A&B, Tiverton  
(1840107)  
SECTOR: Electric Power Generation  
REGION: Southwest

#### SUMMARY

Rainbow trout acute lethality toxicity tests for 26 effluent samples collected from 5 discharge sites between December 1990 and May 1991 were submitted by Bruce Nuclear Power Development Services of Tiverton.

The six samples from the Sewage Treatment Plant (100) were not acutely lethal to trout.

Five of six samples from each of the CE Blowdown A Lake (200), CE-NGSA (300) and CE-SP STPO (400) were non-lethal. One sample from each outfall had a 96 h LC50 > 100%.

Two samples were collected from CCW Outfall BNPDS (1500). One sample was non-lethal and the other had a 96 h LC50 > 100% effluent.

A Ministry audit sample collected from the SW-D Point Ditch (800) was non-lethal. An audit sample from the WTP Neutral Sump (1400) was acutely lethal to trout with a 96 h LC50 = 14.1%.

---

#### Sewage Treatment Plant

06902100 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910133 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910365 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910556 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910782 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06911003 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Bruce Nuc Power Dev't Services A&B (continued)

CE Blwdn A Lake

06902096 sampled: 12/10/90 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 20% & 10% MORTALITY IN 100% CONCENTRATIONS.

06910131 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910369 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910552 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910776 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06911001 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

CE-NGSA

06902098 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910129 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910367 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910550 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910780 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910999 sampled: 05/27/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 5% MORTALITY IN 100%.

Bruce Nuc Power Dev't Services A&B (continued)

CE-SP STPO

06902090 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910135 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910363 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910554 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910778 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06911005 sampled: 05/27/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 5% MORTALITY IN 100%.

EC-Chem Waste Pond

SW-Chem Laydown

SW-D Point Ditch

03910200 sampled: 03/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 5 mg/L; MOE Audit

SW-E Bound Ditch

SW-NGS-A Switchyd

SW-NGS-B Switchyd

SW-Oil Unloading

Waste Disposal Site

Bruce Nuc Power Dev't Services A&B (continued)

WTP Neut. Sump

03910201 sampled: 03/28/91 LC50: 14.1 %  
95% fid. limits: 10.0 - 20.0 %  
comments: Effluent Hardness = 360 mg/L; MOE Audit

CCW Outfall BNPDS

06910361 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910997 sampled: 05/27/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 50%.

Rain Gauge

COMPANY: Bruce Nuc Power Dev't Services A&B, Tiverton  
(1840107)  
SECTOR: Electric Power Generation  
REGION: Southwest

#### SUMMARY

Daphnia magna acute lethality toxicity test data for 26 effluent samples collected between December 1990 and May 1991 were submitted by Bruce Nuclear Power Development Services of Tiverton.

Six samples from each of the Sewage Treatment Plant (100) and CE Blowdown A Lake (200) were not acutely lethal to Daphnia. The two samples from CCW Outfall BNPDS (1500) were also non-lethal.

Five of six samples from each of CE-NGSA (300) and CE-SP STPO (400) were non-lethal, and the remaining sample from each outfall had LC50s > 100%.

Ministry audit samples collected from SW-D Point Ditch (800) and WTP Neutral Sump (1400) in March were acutely lethal to Daphnia. 48 h LC50s were 70.7 and 7.9% effluent for each effluent, consecutively.

---

#### Sewage Treatment Plant

06902101 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910134 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910366 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910557 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910783 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06911004 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED

Bruce Nuc Power Dev't Services A&B (continued)

CE Blwdn A Lake

06902097 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910132 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910370 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910553 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910777 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06911002 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED

CE-NGSA

06902099 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910130 sampled: 01/28/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910368 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910551 sampled: 03/25/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 100%.

06910781 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06911000 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED

Bruce Nuc Power Dev't Services A&B (continued)

CE-SP STPO

06902091 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910136 sampled: 01/28/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY IN 10 & 20%.

06910364 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910555 sampled: 03/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910779 sampled: 04/22/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06911006 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED

EC-Chem Waste Pond

SW-Chem Laydown

SW-D Point Ditch

03910200 sampled: 03/26/91 LC50: 70.7 %  
95% fid. limits: 50.0 - 100.0 %  
comments: Effluent Hardness = 5 mg/L; MOE Audit

SW-E Bound Ditch

SW-NGS-A Switchyd

SW-NGS-B Switchyd

SW-Oil Unloading

Waste Disposal Site



Bruce Nuc Power Dev't Services A&B (continued)

WTP Neut. Sump

03910201 sampled: 03/26/91 LC50: 7.9 %  
95% fid. limits: 5.9 - 10.4 % slope: 5.5  
comments: Effluent Hardness = 360 mg/L; MOE Audit

CCW Outfall BNPDS

06910362 sampled: 02/25/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910998 sampled: 05/27/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED

Rain Gauge



COMPANY: Chalk R. Nuc. Laboratories, Chalk River  
(2950301)  
SECTOR: Electric Power Generation  
REGION: Southeast

#### SUMMARY

Rainbow trout acute lethality toxicity test data for fourteen effluent samples collected from three outfalls between December 1990 and May 1991 were submitted by Chalk River Laboratories of Chalk River.

One of two samples from the CW-Once Through CW (200) was non-lethal and the other sample had a 96 h LC50 > 100%.

Three of six samples from the pH Drain (400) were non-lethal and one sample had an LC50 > 100%. The samples collected in February and March were acutely toxic to trout with 96 h LC50s of 31.6 and 52.4% respectively.

All six samples from the Sanitary Sewer (500) were lethal to trout with 96 h LC50s between 14.2 and 80.6% effluent.

---

#### \*\*\* Waste Tr Center

##### CW-Once Through CW

14911031 sampled: 02/18/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911058 sampled: 04/15/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

EO

##### Ph Drain

14901101 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911010 sampled: 01/21/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 6 fish in 100%.deaths: 24-96hr:2/6

14911029 sampled: 02/18/91 LC50: 31.6 %  
95% fid. limits: 25.0 - 40.0 %  
comments:

Chalk R. Nuc. Laboratories (continued)

14911046 sampled: 03/25/91 LC50: 52.4 %  
95% fid. limits: 49.4 - 55.5 %  
comments:

14911059 sampled: 04/15/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14911074 sampled: 05/13/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

Sanitary Sewer

14901102 sampled: 12/10/90 LC50: 80.6 %  
95% fid. limits: 65.0 - 100.0 %  
comments:

14911011 sampled: 01/21/91 LC50: 15.7 %  
95% fid. limits: 11.6 - 21.2 %  
comments:

14911030 sampled: 02/18/91 LC50: 80.6 %  
95% fid. limits: 65.0 - 100.0 %  
comments:

14911045 sampled: 03/25/91 LC50: 79.9  
95% fid. limits: 77.6 - 82.2  
comments:

14911060 sampled: 04/15/91 LC50: 14.2 %  
95% fid. limits: 10.3 - 19.5 %  
comments:

14911075 sampled: 05/13/91 LC50: 45.0 %  
95% fid. limits: 37.5 - 53.8 %  
comments:

SW-01 Stream

SW-03 Storm Sewer

SW-04 Storm Sewer

SW-05 Storm Sewer

Chalk R. Nuc. Laboratories (continued)

WDS-02 Stream

WDS-Duke Stream

WDS-Perch Creek

Rain Gauge

Intake Water



COMPANY: Chalk R. Nuc. Laboratories, Chalk River  
(2950301)  
SECTOR: Electric Power Generation  
REGION: Southeast

#### SUMMARY

Daphnia magna acute lethality toxicity test data for fourteen effluent samples, from three outfalls, collected between December 1990 and May 1991 were submitted by Chalk River Laboratories of Chalk River.

Both samples from the CW-Once Through CW (200) and four of six samples from the pH Drain (400) were not acutely lethal to Daphnia. One sample from the pH Drain had a 48 h LC50 > 100%, and the remaining sample was toxic, with an LC50 = 47.2%.

All six samples collected from the Sanitary Sewer were lethal to Daphnia with 48 h LC50s between 14.1 and 64.3% effluent.

---

#### \*\*\* Waste Tr Center

##### CW-Once Through CW

14912031 sampled: 02/18/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14912058 sampled: 04/15/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

#### EO

##### Ph Drain

14902101 sampled: 12/10/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14912010 sampled: 01/21/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14912029 sampled: 02/18/91 LC50: 47.2 %  
95% fid. limits: 37.9 - 58.7 %  
comments:

14912046 sampled: 03/25/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

Chalk R. Nuc. Laboratories (continued)

14912059 sampled: 04/15/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

14912074 sampled: 05/13/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

Sanitary Sewer

14902102 sampled: 12/10/90 LC50: 57.1 %  
95% fid. limits: 46.7 - 69.8 %  
comments:

14912011 sampled: 01/21/91 LC50: 17.4 %  
95% fid. limits: 13.1 - 22.9 %  
comments:

14912030 sampled: 02/18/91 LC50: 38.8 %  
95% fid. limits: 33.1 - 45.5 %  
comments:

14912045 sampled: 03/25/91 LC50: 64.3 %  
95% fid. limits: 53.6 - 77.0 %  
comments:

14912060 sampled: 04/15/91 LC50: 14.1 %  
95% fid. limits: 10.0 - 20.0 %  
comments:

14912075 sampled: 05/13/91 LC50: 28.3 %  
95% fid. limits: 20.0 - 40.0 %  
comments:

SW-01 Stream

SW-03 Storm Sewer

SW-04 Storm Sewer

SW-05 Storm Sewer

WDS-02 Stream

WDS-Duke Stream

Chalk R. Nuc. Laboratories (continued)

WDS-Perch Creek

Rain Gauge

Intake Water





COMPANY: Darlington-Construction, Bowmanville  
(1840800)  
SECTOR: Electric Power Generation  
REGION: Central

#### SUMMARY

Rainbow trout acute lethality toxicity test data from twenty effluent samples and six Intake Water samples collected between December 1990 and May 1991 were submitted by Darlington-Construction of Bowmanville.

All six samples of Bowmanville Water (1200) were not acutely lethal to trout. Similarly the two samples from the CW-Compressors (300) were non-lethal.

Four samples of Boiler Blowdown Effluent (200) were non-lethal and one sample had a 96 h LC50 > 100%. The sample collected in May was lethal and had an LC50 = 54.8%. A Ministry audit sample collected in April was non-lethal.

Three of six samples from Sewage Treatment (800) were not acutely lethal to trout, and two samples had LC50s > 100%. One sample collected in April was toxic to trout with an LC50 = 7.1%. A Ministry audit sample collected in April was also toxic to Trout with an LC50 = 45%. The Ministry audit sample collected in January had an LC50 > 100%.

One of six samples from the WTP-Neutral Sump (1100) was non-lethal and one sample had an LC50 > 100%. Four samples were acutely toxic to trout with 96 h LC50s between 14.1 and 37% effluent. A Ministry audit sample collected in April was also lethal to trout with an LC50 = 46.7%

---

#### \*\*\* TRF Boiler Blwdn

##### Boiler Blwdn eff

06902022 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910038 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910197 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910469 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: CONDUCTIVITY METERS CHANGED DURING TESTING.

Darlington-Construction (continued)

06910669 sampled: 04/08/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 5% MORTALITY IN 100%.

03910227 sampled: 04/10/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 90 mg/l; M.O.E. Audit

06910832 sampled: 05/06/91 LC50: 54.8 %  
95% fid. limits: 50.0 - 60.0 %  
comments: COMPLETE MORTALITY IN 60%.

CW-compressors

06910199 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910834 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

EC-Lagoon 1

EC-Lagoon 2

EC-Tank 2

EC-Tank 4

Sewage Treatment

06902020 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910036 sampled: 01/14/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 20% MORTALITY IN 100% CONCENTRATION.

01910014 sampled: 01/16/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA Audit

06910195 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910467 sampled: 03/11/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: CONDUCTIVITY METERS CHANGED DURING TESTING.

Darlington-Construction (continued)

03910228 sampled: 04/10/91 LC50: 45.0 %  
95% fid. limits: 35.2 - 57.5 % slope: 6.0  
comments: Effluent Hardness = 140 mg/l; M.O.E. Audit

06910683 sampled: 04/10/91 LC50: 7.1 %  
95% fid. limits: 5.0 - 10.0 %  
comments: COMPLETE MORTALITY IN 10%.

06910841 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

SW-Se Corner

SW-Shops Warehouse

WTP-Neutral Sump

06902024 sampled: 12/03/90 LC50: 14.1 %  
95% fid. limits: 10.0 - 20.0 %  
comments: COMPLETE MORTALITY IN 20% TEST CONCENTRATION.

06910040 sampled: 01/14/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: PARTIAL MORTALITY IN 10,65,& 100% .

06910239 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910465 sampled: 03/11/91 LC50: 37.0 %  
95% fid. limits: 33.9 - 40.4 %  
comments: COND. IN 30% - 100% CONC. >20,000.

06910667 sampled: 04/08/91 LC50: 14.1 %  
95% fid. limits: 10.0 - 20.0 %  
comments: COMPLETE MORTALITY IN 20%.

03910229 sampled: 04/10/91 LC50: 46.7 %  
95% fid. limits: 35.6 - 61.1 % slope: 6.0  
comments: Effluent Hardness = 7590 mg/l; M.O.E. Audit

06910836 sampled: 05/06/91 LC50: 37.0 %  
95% fid. limits: 33.9 - 40.4 %  
comments: COND. IN ALL BUT 10% & CNTRL TO BE MULT BY 10

Darlington-Construction (continued)

Bowmanville water

06902018 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910034 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910193 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910463 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910665 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06910839 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Settlement Pond

Rain Gauge

COMPANY: Darlington-Construction, Bowmanville  
(1840800)  
SECTOR: Electric Power Generation  
REGION: Central

#### SUMMARY

Daphnia magna acute lethality toxicity test data from twenty effluent samples and six Intake Water samples collected between December 1990 and May 1991 were submitted by Darlington-Construction of Bowmanville.

One of six samples of Bowmanville Water (1200) was acutely lethal to Daphnia. The remaining samples were non-lethal.

Both samples collected from the CW-Compressors (300) were non-lethal.

Four of six samples of Boiler Blowdown Effluent (200) were not acutely lethal to Daphnia. One sample had a 48 h LC50 > 100% and the sample collected in May was toxic, with an LC50 = 65.5% effluent.

Three of six Sewage Treatment (800) samples were not acutely lethal to Daphnia. The three remaining samples were lethal, with 48 h LC50s ranging from 5.9 to 77.9% effluent. One Ministry audit had an LC50 > 100%, and a second audit was acutely lethal, with an LC50 = 18%.

Two of six WTP-Neutral Sump (1100) samples were non-lethal. The remaining four samples had 48 h LC50s ranging from 5.9 to 14.1% effluent. A Ministry audit sample collected in April was lethal to Daphnia with an LC50 = 8.8%.

---

\*\*\* TRF Boiler Blwdn

#### Boiler Blwdn eff

06902023 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910039 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910198 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910470 sampled: 03/11/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 10% MORTALITY AT FULL STRENGTH EFFLUENT

Darlington-Construction (continued)

06910670 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

03910227 sampled: 04/10/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: Effluent Hardness = 90 mg/l; MOE Audit

06910833 sampled: 05/06/91 LC50: 65.5 %  
95% fid. limits: 58.8 - 72.9 %  
comments: 60% MORTALITY IN 65%.

CW-compressors

06910200 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910835 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

EC-Lagoon 1

EC-Lagoon 2

EC-Tank 2

EC-Tank 4

Sewage Treatment

06902021 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910037 sampled: 01/14/91 LC50: 57.0 %  
95% fid. limits: 50.0 - 65.0 %  
comments: COMPLETE MORTALITY IN 65% TEST CONCENTRATION

02910014 sampled: 01/16/91 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA Audit

06910196 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910468 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Darlington-Construction (continued)

03910228 sampled: 04/10/91 LC50: 18.0 %  
95% fid. limits: 13.0 - 25.0 %  
comments: Effluent Hardness = 140 mg/l; MOE Audit

06910684 sampled: 04/10/91 LC50: 5.9 %  
95% fid. limits: 5.0 - 7.0 %  
comments: 30% MORTALITY IN 5%.

06910842 sampled: 05/06/91 LC50: 77.9 %  
95% fid. limits: 72.9 - 83.2 %  
comments: COMPLETE MORTALITY IN 100%.

SW-Se Corner

SW-Shops Warehouse

WTP-Neutral Sump

06902025 sampled: 12/03/90 LC50: 5.9 %  
95% fid. limits: 4.9 - 7.0 %  
comments: 30% MORTALITY IN 5% TEST CONCENTRATION.

06910041 sampled: 01/14/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910240 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910466 sampled: 03/11/91 LC50: 14.1 %  
95% fid. limits: 10.0 - 20.0 %  
comments: COND. OF 30% - 100% CONC. >20,000.

06910668 sampled: 04/08/91 LC50: 6.7 %  
95% fid. limits: 5.9 - 7.5 %  
comments: 10% MORTALITY IN 5%.

03910229 sampled: 04/10/91 LC50: 8.8 %  
95% fid. limits: 6.0 - 13.0 %  
comments: Effluent Hardness = 7590 mg/l; MOE Audit

06910837 sampled: 05/06/91 LC50: 10.7 %  
95% fid. limits: 8.6 - 13.3 %  
comments: COND. IN 100% > 20,000 AND IN 20% MULT BY 10



Darlington-Construction (continued)

Bowmanville water

06902019 sampled: 12/03/90 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910035 sampled: 01/14/91 LC50: 90.6 %  
95% fid. limits: 65.0 - 99.9 %  
comments: 70% MORTALITY IN 100% TEST CONCENTRATION.

06910194 sampled: 02/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910464 sampled: 03/11/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910666 sampled: 04/08/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06910840 sampled: 05/06/91 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Settlement Pond

Rain Gauge





